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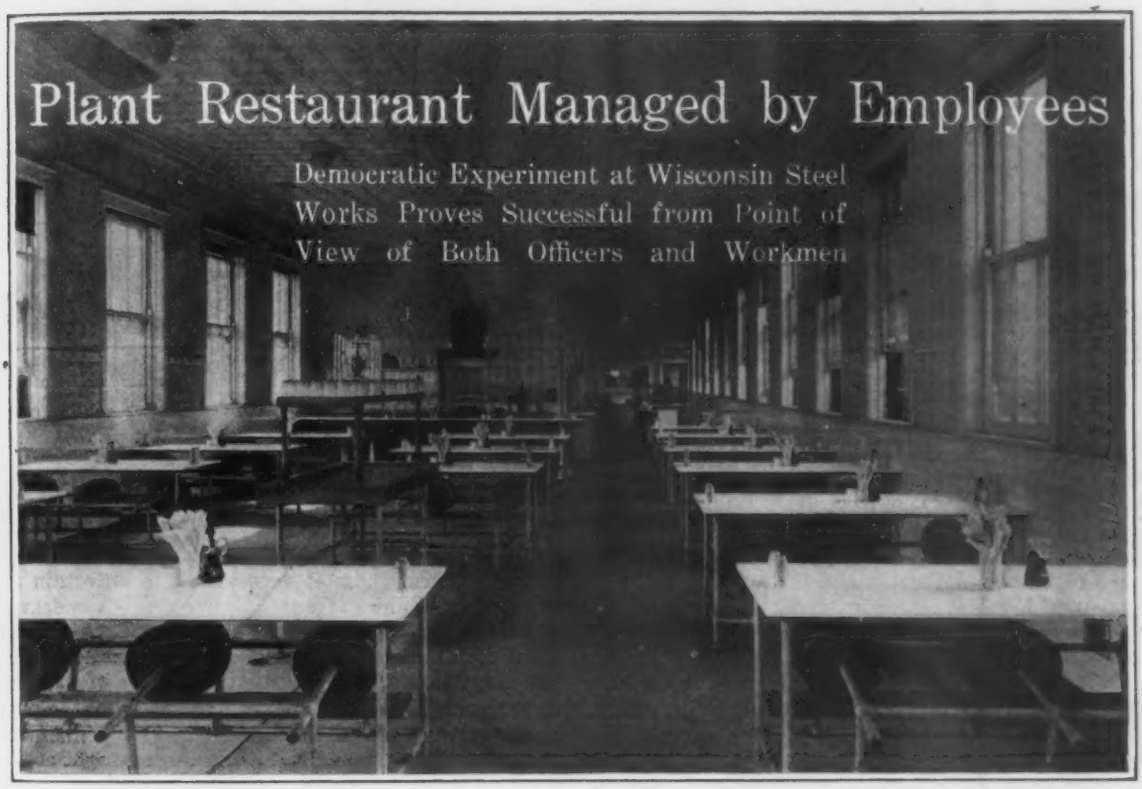
Plant Restaurant Managed by Employees

Democratic Experiment at Wisconsin Steel Works Proves Successful from Point of View of Both Officers and Workmen



The Stools in the Dining Hall are Folded Under the Tables to Facilitate Washing the Floor. The artesian water fountain may be observed in the left foreground, while the short order counter is in the left background and the cafeteria serving counter in the right background

INDUSTRIAL plants in increasing number are learning that the establishment of first-class restaurants serving wholesome food at reasonable prices is potent in winning the good will of employees and in increasing their efficiency. To convince their men that the company restaurant was operated solely for service and with no idea of profit, the Wisconsin Steel Works turned over the management of the institution to the employees. This step was taken some time after the restaurant, which was completed in October, 1917, had been in operation. Whether the employees had previously misunderstood its purpose, or had not yet become thoroughly acquainted with its advantages, is uncertain, but it is nevertheless a fact that the restaurant gained steadily in popularity from the time the men were put in control.

Employees' Committee Elected Semi-Annually

The directing board in charge is made up of ten employees elected by their fellows. Members serve for one year, but as one-half of the committee retires every six months the body is at no time altogether inexperienced. The first board was elected from nominees chosen by the department superintendents, each of which named three candidates who were grouped together on one general ballot. Since the first election the superintendents have had nothing to do with nominations. On the contrary, the existing committee selects three candidates from each major department, from whom the men elect their representatives.

The committee chooses its own chairman and secretary, and convenes every third week, on Thursday. The meetings are attended also by the superintendent of labor and safety of the company and the restaurant manager who has at his command full details regarding operation. Prices, the kind and quality of food served, the appearance of the restaurant, the conduct of waiters, the disposal of garbage, the installation of new cooking equipment —are among the subjects discussed by the board. Daily as well as monthly cost statements are maintained, so that the committee is at all times possessed of information regarding the relation of returns to expenditures. In the month of May, for instance, it was discovered that the restaurant had operated at a loss. The average charge per meal was 26.7c., while the average cost of producing it was 28.4c. At the meeting of the committee on June 12 this loss was discussed at length, and it was unanimously decided to increase the price of short orders and hot table meals five cents. The manager was instructed to that effect, and the change in price became effective June 13.

In the Right Foreground of the Kitchen is an Electric Potato Masher and in the Left-Hand Corner a Potato Peeling Machine

Nothing is charged for interest on the investment in the building and equipment, lighting, ventilation, heat, refrigeration, or steam, which is used largely for cooking. The charges for meals are merely expected to cover the cost of the food, the wages of the employees in the restaurant, the cost of gas used in preparing short orders, and the repair or replacement of existing equipment. All other charges are borne by the company.

It is the province of the employees' committee to decide whether an advance or reduction in prices is justified at any time. It has been found that operation at a loss is sometimes only a temporary condition, and is balanced by subsequent profits. In 1918, for instance, several months showed losses, but the conclusion of the year found a surplus in the restaurant's treasury. As profits are not sought, surpluses go back to the patrons of the restaurant in lower prices for meals, although a small reserve is generally kept in the treasury to meet future contingencies.

It is the duty of the committee, as a creation of the employees whom it represents, to entertain all suggestions coming from the men and to endeavor in every way to improve the restaurant. A perusal of the minutes of committee meetings discloses the discussion of a wide range of topics of varying importance. At one meeting, for instance, the purchase of an electric potato-mashing machine was recommended. The machine was later bought at the expense of the company and is giving satisfaction. On another occasion it was decided that a canopy between the restaurant and an adjoining washroom would prove a great convenience to the men, and

A Workman Who Has Just Left the Washroom at the Right Is Reading the Menu as Displayed on a Blackboard Leaning Against the Entrance Vestibule

this also was provided by the company. Other typical subjects considered include a proposed reduction in the price of coffee and toast, provision of horseradish on the tables, etc.

One of the most important recent innovations was the establishment of a bonus plan for employees of the restaurant. According to the provisions of this scheme each employee, from the restaurant manager down to the waitresses and porters, receives from one-half cent to one and one-half cents in addition to his regular wage for every dollar of the gross returns in excess of $100 on the first five days of the week, $90 on Saturday, and $50 on Sunday.

Notwithstanding the fact that the plant is now running slack, the restaurant is serving more meals than ever before. In May, 1919, the total number of meals served was 20,998, whereas in November, 1918, when the plant was running full, only 19,731 meals were served. The restaurant serves about 800 meals a day except on Saturday and Sunday, when the patronage is smaller. As supplies are purchased in large quantities, the prices paid are considerably below retail quotations. Staples are bought by the purchasing department of the company, while perishables are purchased by the restaurant manager. Only the best grades of meat, butter, eggs, coffee and sugar are served. All milk used is tested for butter fat periodically, and generally runs from 3.6 to 3.8 per cent, as against the city ordinance requirement of but 3 per cent. A typical menu of recent date includes the following:

Roast pork and dressing	30c.
Baked halibut steak	26c.
Kidney stew	25c.
Macaroni and tomatoes	25c.
Pork and beans	25c.

Soup, bread and butter, coffee, tea or milk, and a dessert, stewed prunes, for example, as on the day in question, are served free with all orders. Pie, ice cream, soft drinks, pickles and fruits in season can be purchased in addition to the regular menu.

Regular luncheons are served except between 2 a. m. and 11 a. m. Short orders are sold at all times, except during the noon lunch hour, between 11 a. m. and 2 p. m. The following is typical of the short-order service provided:

T-bone steak	40c.
Sirloin steak	35c.
Pork chops (three)	35c.
Pork tenderloin	40c.
Bacon and eggs	35c.
Wheat cakes	10c.
Boiled ham sandwich	10c.
Cheese or fried ham sandwich	10c.

All short orders for meat or eggs include potatoes, bread and butter, coffee, milk or tea.

The restaurant building is a one-story brick structure with attic and basement, about 45 x 120 ft. It has a central location in the plant, being adjacent to bar mills Nos. 1, 2 and 4. A few feet south of the entrance is a washroom where showers and

The Serving Counter Extends from the Entrance to the Dining Hall. The patron helps himself to an aluminum tray and slides it on the rails as he is served.

At the Left in the Upper Circle is a Soup Kettle and in the Center a Pressure Cooker in Which Vegetables and Some Meats Are Prepared. Both the kettle and the cooker are supplied with the steam under 15 lb. pressure piped from the works power plant.

In the Lower Circle is Shown the Dish Washing Machine in the Kitchen, a Three Tier Dish Bus, and the Short Order Gas Range.

wash bowls, with running hot and cold water, soap and towels are provided free of charge. In the south third of the restaurant are situated the kitchen and the entrance aisle along which the serving counter is located. When a patron enters he provides himself with an aluminum tray, knife, fork and spoons, and places his tray on a front rail, on which he slides it as he is served. At the end of the counter an attendant gives him a check for the amount of his meal. The men seat themselves at white composition glass tables which will accommodate six persons. The stools may be folded under the tables to facilitate washing the concrete floor. Artesian well water is obtainable at a fountain in the center of the room. In addition to the tables there is a short-order counter with eight stools. During the rush period between 11 a. m. and 2 p. m. the patrons pay the cashier stationed at the exit at the north end of the restaurant. At other times payment is made at the counters.

For the most part, regular meals are cooked on a large gas range, but there is also provided a large vegetable steamer, the steam being provided free of charge by the company and piped from the power plant of the works. Through a reducing valve the pressure of steam is lowered from 150 to 15 lb. In addition to the large gas range there is a small gas range for short orders. Electric potato mashing and peeling machines, which were installed at the company's expense, simplify the work of the cooks. A refrigerator is provided which is cooled by a refrigerating machine of eight tons capacity located in the basement. Dirty dishes are brought into the kitchen on a three-tier bus, from which they are transferred to racks adjacent to a dish-washing machine which both cleanses and dries the dishes. A ventilating fan in the outside wall keeps the air in the kitchen cool and in circulation at all times.

Provision has also been made for the proper ventilation of the restaurant. A ventilator intake equipped with air sacks to catch the dust is situated in the attic. It discharges the air through ventilators in the ceiling of the restaurant, changing the atmosphere every three minutes. Air exits are located at intervals in the walls of the restaurant. In the winter the ventilator fan serves the purpose of both heating and circulation. As the air is drawn in from the outside it passes through steam pipes and then into the restaurant. In hot weather, ventilation is effected by three fans attached to the ceiling of the dining hall.

Share Holdings of Government Purchasing Officials

WASHINGTON, Aug. 19.—A considerable number of officers of the Ordnance Department authorized to purchase supplies had business interests as shareholders and officeholders in firms and corporations from which the Army made purchases. The Senate by a resolution on Feb. 28, 1919, directed the Secretary of War to submit a list of all the officers and other persons who were authorized to make purchases for the military establishment with a statement of any interest they might have as "shareholders, partners or security holders in any corporation or partnership, firm or business, which has been awarded contracts for furnishing of ordnance, quartermaster, medical or other supplies for the military establishment."

The following is a list of officers of the Ordnance Bureau who had interests in iron and steel and allied industries:

Chemical Warfare.—Col. Wm. H. Walker (C. W. S.), United States Smelting & Refining Co., General Electric Co., Utah Copper Co., Miami Copper Co., Anaconda Copper Co., United States Steel Corporation, American Smelting & Refining Co., Kennicott Copper Co.

Air Service.—H. K. S. Williams (civilian), stockholder in the Thompson-Starrett Co., Pittsburgh.

Construction Division.—Lt. Col. H. S. Durant (Q. M. C.), stockholder in United States Steel Corporation; Maj. J. S. Overn (Q. M. C.), stockholder in Hoffman Engineering & Constructing Co., Philadelphia; Capt. M. Fuhrer (Q. M. C.), stockholder in United States Steel Corporation; W. C. Bogue, stockholder in United States Steel Corporation; John J. Doody, stockholder in United States Steel Corporation; E. C. Morse, Westinghouse Electric & Mfg. Co.; H. L. Sherman, stockholder in Pittsburgh Testing Laboratories; I. H. Vogel, stockholder in American Radiator Co.

Engineer Corps.—Maj. Lorimer D. Miller, shareholder in the Maxwell Motors Co.

Ordnance Bureau.—Brig. Gen. Wm. Crozier (Ord.), Inspiration Consolidated Copper Co. (314 shares); Col. J. W. Benet (Ord.), Baldwin Locomotive Works; Col. R. P. Lamont (Ord.), director American Steel Foundries Co.; Col. Samuel McRoberts (Ord.), director in Baldwin Locomotive Works; Lt. Col. M. G. Baker (Ord.), assistant manager of sales, American Vanadium Co., no active part in business although receiving portion of former rate of compensation, securities in Midvale Steel & Ordnance Co., American Vanadium Co., Wharton Steel Co.; Lt. Col. C. N. Black (Ord.), member of engineering firm of Ford, Bacon & Davis, New York, securities in General Electric Co.; Lt. Col. Dale Bumstead (Ord.), securities in International Harvester Co., United States Steel Corporation, General Electric Co., Chicago Pneumatic Tool Co.; Lt. Col. J. G. Cowling (Ord.), securities in Federal Pressed Steel Co.; Lt. Col. A. W. Fairchild (Ord.), member of Miller, Mack & Fairchild, lawyers, securities in Federal Pressed Steel Co., Milwaukee; Lt. Col. H. H. Lehman (Ord.), treasurer and sales manager J. Spencer Turner Co., securities in the Stafford Co., Underwood Typewriter Co., Sears Roebuck Co., Studebaker Corporation, Peerless Motor Co., Alabama Mineral Land Co., White Motor Co., Continental Can Co., Kelsey Wheel Co.; Lt. Col. D. L. McKay (Ord.), Savage Arms Co.; Lt. Col. William Williams (Ord.), General Electric Co., United States Steel common and preferred, Otis-Fenson Elevator preferred, Dupont Powder Co. preferred, Westinghouse Electric preferred, United Lead Co., Bethlehem Steel Co.; Maj. R. D. Day (Ord.), United States Steel Corporation, United States Radiator Corporation; Maj. W. H. Gelshennen (Ord.), director H. J. Baker Co., securities in Westinghouse Electric & Mfg. Co.; Maj. Gordon Grand (Ord.), Westinghouse Electric & Mfg. Co., United States Steel Corporation, National Lead Co., Bethlehem Steel Co., Yale & Towne Mfg. Co.; Maj. R. R. Harrison (Ord.), Midvale Steel & Ordnance Co., United States Steel Corporation, Ray Consolidated Copper Co.; Maj. R. H. Hawkins (Ord.), Standard Underground Cable Co., Westinghouse Electric & Mfg. Co., Westinghouse Air Brake Co.; Maj. A. C. Hinman (Ord.), director and vice-president McMullen Machine Co.; Maj. H. A. Lozier (Ord.), manufacturer of motor cars; Maj. G. R. Nichols (Ord.), United States Steel Corporation, American Steel Foundries; Maj. R. H. Swartout (Ord.), Westinghouse Electric & Mfg. Co., Pressed Steel Car Co., Lackawanna Steel Co.

Signal Corps.—Lt. W. H. Lipscomb, United States Steel Corporation, employed by United States Steel Products Co.

(Note.—After the alphabetical arrangement of the names had been completed many additional reports were received in the office of the Director of Purchase, among them the following):

Lt. E. C. Ehrens (Q. M. C.), Camp Holabird, Md., purchasing agent Bucyrus Co., South Milwaukee, Wis.

Capt. R. P. Atwood (Q. M. C.), zone supply officer, Chicago, stockholder in the National Tool & Mfg. Co., St. Louis.

Maj. Wm. J. Bass, office of the zone supply officer, Jeffersonville, Ind., stockholder in Chattanooga Wagon Co., Chattanooga, Tenn.

Capt. Benjamin Carpenter, chief of section, clothing and equipage division, president Geo. B. Carpenter & Co., Inc., Chicago; president Great Lakes Supply Co., Chicago; also treasurer and vice-president Elk Rapids Iron Co., Elk Rapids, Mich.; director Commonwealth Edison Co., Chicago; stockholder and bondholder in about twenty-five railroad, manufacturing and public service corporations as investor; trustee of several estates owning securities of railroad, manufacturing and public service corporations. When ordered to service July, 1917, he gave up all active connection with the management of his affairs in Chicago.

Col. Fred Glover (motor vehicle), director Emerson-Brantingham Co., Rockford, which built vehicles for the army but received orders before Col. Glover took charge of the work. Had nothing to do in any way with their contract or its cancellation.

Capt. Jos. B. Montgomery, Jr. (Eng. C.), machinery and engineering division, $1,000 in stock in United States Steel Corporation.

First Lt. Albert N. Smith (Eng. C.), machinery and engineering division, bondholder Bethlehem Steel Co.

Greshom Smith, clothing and equipage division, receives a retaining fee in a consulting capacity from the Tabulating Machine Co., manufacturer of Hollerith machines.

Alexander M. White, administrative division, stockholder in Pyrene Mfg. Co., Wire Wheel Co. of America, and Lukens Steel Co.

Maj. Oliver B. Zimmerman (Eng. C.), machinery and engineering material division, retained for consultation by International Harvester Co.

Maj. M. B. Edgerton (A. M. C.), general supply depot, Chicago, 30 to 40 shares common and preferred stocks International Harvester Co. of New Jersey and of Corporation Co. during the time he acted as contracting and purchasing officer.

O. F. S.

Method of Testing Cleanness of Producer Gas

Commonplace Apparatus Successfully Used In the Accurate Determination of the Efficiency of Cleaning—Other Methods Used

BY H. F. SMITH*

THE increasing use of manufactured industrial gas stimulates interest in practical plant methods of checking up gas making processes. Several methods of cleaning producer gas for industrial use have been proposed, but the difficulty of accurately determining the efficiency of cleaning has resulted in comparatively few tests being made and very little data is available as to the actual effectiveness of the various processes of cleaning and as to the degree of efficiency of cleaning that is necessary for satisfactory results for any given service.

The method of test ordinarily employed is to make weight determinations of a paper filter or extraction thimble before and after passing a measured quantity of gas. While this method is quite satisfactory for dust determinations where a large volume of gas can be passed and a large weight of dust collected for weighing, it is not so satisfactory for tar determinations, since tar will soon block up the filter and prevent a large sample being taken. Furthermore, the process of drying to constant weight before and after the sample is taken is a tedious and more or less delicate operation and the weighing involves the use of chemical balances of high accuracy. These features serve to make this method a laboratory, rather than a plant process. The use of "color charts" has been suggested, a filter paper through which a stated quantity of gas has been passed, thus giving it a certain stain or shade of color, being compared with a standard color series and the cleanness of the gas estimated in this way. This method is open to two serious objections. Different kinds of coal give tars that differ in color, some being brown when viewed in a thin film, others being black. Thus a given weight of black tar will produce a much darker shade on the filter paper than the same weight of brown tar. Also, many tars change color on exposure to oxidation, being darker after standing in the air a short time than when first taken.

These facts make the preparation of a standard color chart difficult if not impossible.

With the idea of overcoming some of these difficulties, the writer has employed with much satisfaction the following method of test, which has proved to be sufficiently simple for use by the average plant operative, and is in addition remarkably accurate.

A filter paper holder of any convenient size—say to take a 3-in. filter—and an ordinary dry test meter reading down to 0.01 cu. ft., such as is commonly used by city gas companies to demonstrate gas consumption on various appliances, is all that is necessary in the shape of equipment.

Method of Procedure

The procedure is briefly as follows: Connection is made to the discharge or clean gas side of the apparatus to be tested, and a sample of gas taken through a clean white filter paper. The filter holder should be placed with the paper horizontal and the flow of gas upward. The connection to the point of sampling should be as short and direct as possible. The weight of flow should be controlled by a valve placed on the discharge side of the filter holder, between it and the meter. If a valve is used in the connection between the point of sampling and the filter holder it must be wide open during the test. With a 3-in. filter paper, gas can be passed at a rate of about 1 cu. ft. per min. A higher rate will probably tear a hole in the paper and invalidate the test. Ten cubic feet of gas should be passed through the first paper which should then be removed, marked with the quantity of gas passed, and laid aside for future reference. A second paper with 20 cu. ft. and a third with 30 cu. ft. should be taken in the same way. The connection should then be changed to the inlet or dirty gas side of the apparatus under test, and a series of filter papers taken starting with 0.01 cu. ft. for the first, 0.02 for the second, and so on. Especial care should be taken on this series not to restrict the flow in any way till after the gas has passed the filter. The connection between points of sampling and the filter holder should also be very short and direct, and the space below the filter should be filled with dirty gas before the filter paper is clamped in position so as to insure the full quantity of gas as indicated by the meter that really passes through the filter. The quantity of gas passed through the second series of papers should be such as to make one of them match in shade one of the clean gas series, and a little experience will show the correct volumes for the condition under test.

Suppose for example that the dirty gas paper for 0.01 cu. ft. matches in shade the clean gas paper for 20 cu. ft. This shows that there is as much tar in 0.01 cu. ft. of dirty gas as in 20 cu. ft. of clean gas or in 1 cu. ft. of dirty gas as in 2000 cu. ft. of clean gas. In other words, 1999 parts of tar have been removed out of a total of 2000, giving a cleaning efficiency of $1999 \div 2000 = 99.95$ per cent.

It should be noted that when the efficiency of the cleaning plant is high, a large volume of gas must pass the filters of the clean gas series in order to produce the depth of color given by as little as 0.01 cu. ft. of dirty gas, and for this reason, the accuracy of the method does not change very much even when very high cleaning efficiencies are being secured. The ease with which the determination is made and the exactness with which the results can be checked by series of efficiency tests even in the hands of an inexperienced operator give confidence in the accuracy of the results.

This method does not involve any difficulties of drying and weighing as in the first method mentioned, and is not dependent on any arbitrary color chart as in the second, since the color comparisons are between filter papers stained with equal weights of the same character of tar.

Required Efficiency of Tar Extraction

A satisfactory method of testing tar extractor performance being available, it is only natural to inquire what efficiencies are necessary or desirable for satisfactory service. Most of the data available relates to the cleaning of gas for gas engine service. Several reports from English sources and covering various well-known types of tar extractors run about as follows:

1.—Bubbling washers in which the gas is brought into intimate contact with a washing fluid by being bubbled through it in finely divided streams.

	Tar at Inlet	*Tar at Outlet*	*Purification, Per Cent*
Test No. 1....	11.26	1.54	86.3
Test No. 2....	12.92	1.44	86.8
Test No. 3....	10.5	1.39	86.8

2.—Baffle extractors, similar to the well-known "P & A" in which the gas passes through small apertures and against opposed baffle surfaces. Tests reported were on a tar extractor with six plates or baffles.

	Tar at Inlet	*Tar at Outlet*	*Purification, Per Cent*
Test No. 1....	16.86	0.267	98.4
Test No. 2....	15.15	0.302	98.0
Test No. 3....	10.71	0.258	97.6
Test No. 4....	15.21	0.133	99.1
Test No. 5....	12.89	0.155	98.8
Test No. 6....	15.56	0.420	97.3

*General manager, Smith Gas Engineering Co., Dayton, Ohio.

3.—Centrifugal tar extractors or washing fans.

	Tar at Inlet	Tar at Outlet	Purification, Per Cent
Test No. 1....	3.8	0.426	89.
Test No. 2....	13.8	0.458	96.7
Test No. 3....	26.5	0.69	97.4

Since the above tests were on equipment for cleaning gas for power service, it would seem that 98 per cent cleaning would be considered good average practice for the types of cleaners mentioned, and good enough for gas engine service.

The writer's experience would indicate, however, that for such service a cleaning efficiency of not less than 99 per cent is necessary. Contrary to the usual belief, a well-designed gas engine is not especially sensitive to tar, and will function very well on gas that would be altogether too foul to put into any extensive system of distribution mains. In a gas engine installation the mains between the gas plant and the engine are usually short, the gas delivery pressures low, and velocities of flow moderate. The time elapsing between the cleaning of the gas and its combustion in the engine cylinder is so short that the most of the tar fog that passes the cleaner has no time to precipitate, but is carried at once into the engine cylinder and burned. Where the gas is to be distributed to considerable distances, greater care is necessary in the cleaning. While a great deal of tar fog may pass through quite a long main and appear at the furnace or burner, some is deposited along the way, and as producer tar is too viscous to flow readily at ordinary temperatures, this deposit continues to accumulate in the mains.

If we assume, as some have done, that a moderate degree of cleanness is sufficient for fuel gas, and take 95 per cent cleaning as a standard, 5 per cent of all tar produced would pass into the mains. Producer gas yields from 100 to 200 lb. of tar per ton of coal and this would pass 5 to 10 lb. of tar for each ton of coal gasified. On a plant gasifying one ton per hour we would have from 120 to 240 lb. per day, or 18 to 36 tons of tar per year carried into the distribution system. This will plug a lot of pipe.

Relative Values of Cleaning Efficiencies

Recent improvements made in this country, and the development of more effective methods of cleaning than those described make it easily possible to greatly exceed the efficiencies of cleaning mentioned. Recent tests on several installations of large capacity show efficiencies of over 99.9 per cent—frequently as high as 99.98 per cent. This gas is more than 200 times as clean as the gas mentioned in our example above, and can be carried without difficulty in any sort of distribution system.

It may be of some interest to note the significance of fractional per cents of efficiency in cleaning. At first glance the difference between 99 per cent cleaning and 99.98 per cent would seem small and unimportant.

With 99 per cent cleaning 1 per cent or 0.0100 of tar is carried forward. With 99.98 per cent only 0.02 per cent or 0.0002 of tar passes the cleaner. In other words, gas cleaned at 99.98 per cent efficiency is fifty times as clean as gas cleaned at 99 per cent. This involves as great an increase in cleanness as the whole range from dirty gas up to 98 per cent cleaning, which is also a fifty-fold increase in cleanness.

Manganese Ore in South Africa

WASHINGTON, Aug. 19.—Although there are considerable deposits of manganese in South Africa, only a small proportion of it is coming to the United States, according to a report by Vice Consul Charles J. Pisar at Cape Town.

"Up to about two years ago," reports Mr. Pisar, "the only manganese deposits in South Africa to which any attention had been paid were contained in certain fissure veins in the Cape Province and in the Transvaal. During the past two years more attention has been given to the deposits of this ore and from investigations it was ascertained that manganese ores exist in the Union in three main classes of deposits, namely: (a) fissure veins and lateroid enrichments on the outcrop of such veins; (b) connected with the dolomited and Moodies series. (1) diffused in the dolomites, (2) irregular deposits in the dolomite and Moodies series, and (3) bedded deposits in the dolomite and Moodies series; and (c) lateroidal deposits derived from dolomites.

"According to Government mining engineers, deposits of the first class are fairly numerous in the Table Mountain sandstones in the southwestern districts of the Cape Province. Seven occurrences were inspected, but only three were found to be of any extent, and of these only one is really considerable. However, in all the cases the outcrops were very much larger and richer than the actual veins, showing a distinct lateroidal enrichment of the surface. The manganese content of these ores was low and the phosphorus high. Approximate analyses of the clean, hand-sorted ore from the three most important deposits showed the presence of the following elements, among others (figures represent percentages): Caledon—manganese 38, iron 16 to 20, and phosphorus 0.378; Du Toits Kloof—manganese 40, iron 13 to 22, and phosphorus 0.47 to 0.57; Houts Bay—manganese 38, iron 9 to 16, and phosphorus 0.47 to 0.66.

"The most important deposits of manganese ore opened up in the Union are the lateroidal deposits associated with the dolomite in the Krugersdorp district in the Transvaal. The manganese ore in this district occurs chiefly as dioxide in the form of pyrolusite or psilomelane, and is evidently a replacement mineral as it occurs as a pseudomorph after oxide of iron, chert and shale, with one or another of which minerals it is generally found intimately associated. Nearly every nodule of manganese ore has a certain amount of yellow oxide of iron attached to it, which even with close cobbing cannot be entirely detached, and there is certain to be a high percentage of ferric oxide present in the ore.

"The amount of manganese ore per ton or per cubic yard of ground varies considerably. In practically every case there are indications of manganese, while in certain instances there are found local enrichments or rich pockets, and the nodules become richer and much more abundant, the pockets apparently tapering off at the edges to a poorer zone containing fewer nodules of small size and generally poorer quality. An analysis of this ore shows that it contains from 59 to 63 per cent MnO_2 (manganese dioxide).

"The areas in the Transvaal and Bechuanaland, where the dolomites lie almost horizontally and have suffered from intense denudation, are said to be extensive. Part of the manganese ore produced has been used in the cyanide works of the Rand gold mines, but with the development of an iron-smelting industry in the Union the local demand for manganese ores will be stimulated.

"The manganese occurrences in Natal are chiefly in the Vryheid district, but the quantity available is small and the quality second rate. An analysis of this ore showed that it contained 37.5 per cent of manganese." O. F. S.

Announcement is made by the American Society of Mechanical Inspectors, 35 West Thirty-ninth Street, New York, of the subjects and speakers in the fall course of lectures to be instituted in September by the organization. The list of speakers includes Ernst Mentor, technical supervisor, C. E. Johansson, Inc., New York; Arthur Knapp, president Arthur Knapp Engineering Corporation, New York; A. F. Shore, president Shore Instrument & Mfg. Co., New York; E. J. Bryant, chief tool designer Taft-Peirce Mfg. Co., Woonsocket, R. I.; Paul E. Theis, factory manager Fischer Spring Co., New York; Joseph F. Zeigner, chief inspector Doehler Die-Casting Co., Brooklyn, N. Y., and H. F. Winter, secretary of the organization. The following subjects will be covered: Thread gage inspection, projectograph, pyroscope, gear inspection, die-casting, precision tools and the limit system.

Characteristics of Malleable Cast Iron

Results of the Latest Research on Physical and Other Properties—How Quality Has Been Improved and Uniformity Obtained

THREE exceedingly important contributions to the study of malleable iron have appeared recently. Collectively they have advanced to a measurable extent the metallurgical knowledge of the subject and placed the industry on a higher plane. At the annual meeting in June of the American Society for Testing Materials a paper, "Some Physical Constants of Malleable Cast Iron," was presented by H. A. Schwartz, National Malleable Castings Co., Indianapolis. This was discussed by W. R. Bean, Eastern Malleable Iron Co., Naugatuck, Conn. Earlier in June, at the spring meeting in Detroit of the American Society of Mechanical Engineers, Enrique Touceda, consulting engineer, Albany, N. Y., presented an exhaustive paper, "Research Work in Malleable Iron." The contributions by Mr. Touceda and Mr. Bean are separate reports on the same extensive investigation. Abstracts of the three contributions follow:

Physical Constants of Malleable Cast Iron

BY H. A. SCHWARTZ

THE physical constants of malleable cast iron will vary with the chemical composition and heat treatment of the material. Only tensile strength has been investigated in great detail in its relation to chemical composition. This work involved a critical study of the chemical and physical properties of many thousands of heats. The result is of importance in the present connection only to the extent that it corroborates the conclusion that the amount and form of the free carbon present is the determining factor as regards to quality of the product. The requirements of satisfactory commercial practice are such as to confine the chemical composition within limits so narrow as to practically eliminate the chemical composition of the ferrite as a variable.

The tests upon which this paper is based were made on material of such a character as to pass the present specifications satisfactorily and may be understood as applying to a commercial product of that character. Furthermore they have all been made upon test specimens which are known to be free from defects such as shrinks or blowholes, but are not based upon material selected as being of superior quality. The results here given may therefore be considered as furnishing a conservative basis for engineering calculations.

Behavior Under Tensile Stresses

The tensile properties of malleable cast iron are the only constants now defined by specification. The value assigned for tensile strength is now 45,000 lb. per sq. in., and the elongation required is 7.50 per cent in 2 in. From observation on tests covering many thousands of heats, the writer is of the opinion that the product made by reputable foundries to pass the American Society for Testing Materials' specifications will actually average from 48,000 to 50,000 lb. per sq. in. in tensile strength, and will have an elongation in 2 in. of 10 to 15 per cent.

A number of tests were made, however, on specimens ground to size before annealing. From these observations the following results are selected as typical:

Tensile strength, lb. per sq. in.	Elongation in 2 in., per cent	Reduction in area, per cent
55,200	19	18
55,100	13	20
55,200	17	23

The metal of which these specimens were made is considerably better than the requirements of the standard specification. Although closely alike in tensile strength, the three test specimens represent three different heats.

To record the fact that malleable cast iron differs from all other commercial iron alloys, in that its elongation increases with its tensile strength, Fig. 1 has been prepared. Each point on this graph indicates the tests of a group of heats of the same chemical composition, representing in all 840 heats. The relationship between tensile strength and elongation is not absolutely quantitative, the general relationship that the two vary together is very clearly brought out.

Behavior Under Compressive Stresses

From the nature of the material the ultimate strength in compression is rather vague, for actual failure may never occur, the material merely flowing out indefinitely with increase of load. Curves in the original paper indicate that the material has not actually failed, though it has been compressed to a point probably equivalent to the destruction of any actual structural detail. The tests were not sensitive enough definitely to determine the proportional limit, which, however, seems to be not far removed from 15,000 lb. per sq. in. The conclusion seems warranted that the elastic properties of the material in tension and in compression are approximately the same.

The data given under compression applied only to structural details in which the length is not large as compared with the diameter. In order to give some idea as to the behavior of details in the form of columns made of malleable iron, a few tests were undertaken on specimens ⅝ in. in diameter and 10.6 in. long, having ends of such a form as to cause the specimen to behave as a column with square ends.

In Fig. 2 is given a stress-strain diagram which is the average of tests on three different specimens of this character. Time has been lacking to make a sufficiently extended series of experiments to determine the application of Gordon's or similar formulas to malleable cast iron strut members.

Behavior Under Cross-Bending and Shearing Stresses

Specifications R 17 of the United States Railroad Administration, dated May 1, 1918, provide that the material in the form of bars 1 in. wide on supports 12 in. apart shall support certain specified loads at the center varying with the thickness of the bar, but all corresponding fairly closely to the value 64,000 lb. per sq. in. for the modulus of rupture of the material. Material passing the A.S.T.M. tensile test requirements invariably exceeds this requirement for modulus of rupture.

The data bearing on shearing stresses are based on a series of experiments conducted in cooperation with Professor Thomas at the Rose Polytechnic Institute in January, 1919. The tests were made both by punching a round hole 1 in. in diameter through plates approximately ¼ in. thick which had not been machined, and by subjecting round pins ⅞ in. in diameter to double shearing. The pins were finished to size. Duplicate specimens were tested in order to compare the shearing stress in pins machined after annealing with the same constant determined on specimens ground to size before annealing.

Specimens for each of the three tests were at hand

from the same metal. The average results were:

Shearing Stresses, Pounds per Square Inch

By punching	By shearing finished pin	By shearing pin ground before annealing
45,152	40,340	41,350

The tests made by punching a thin plate indicate a higher shearing stress than that obtained by shearing pins. It seems quite certain that this is due to the fact that, in spite of every precaution, it is not possible to fit the specimen to the shearing block as to cause it to fail absolutely throughout its section.

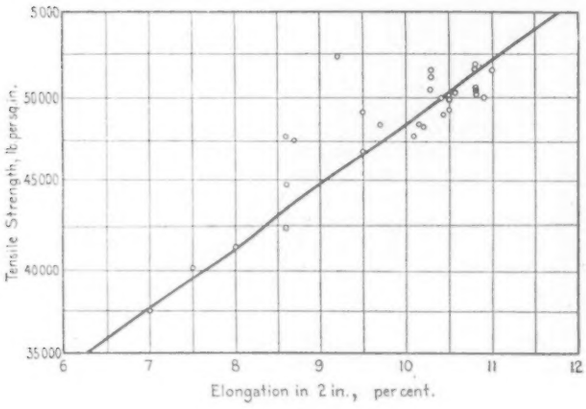


FIG. 1

Fig. 1.—Relation Between Tensile Strength and Elongation of Malleable Cast Iron.

Fig. 2.—Stress-Strain Diagram of Malleable Cast Iron as a Strut.

Fig. 3.—Stress-Strain Diagram of Malleable Cast Iron in Torsion.

Fig. 4.—Specific Gravity of Malleable Cast Iron.

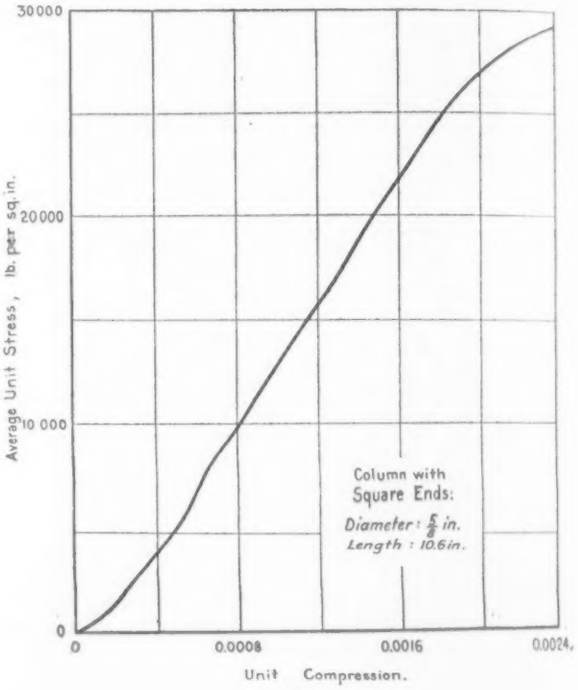


FIG. 2

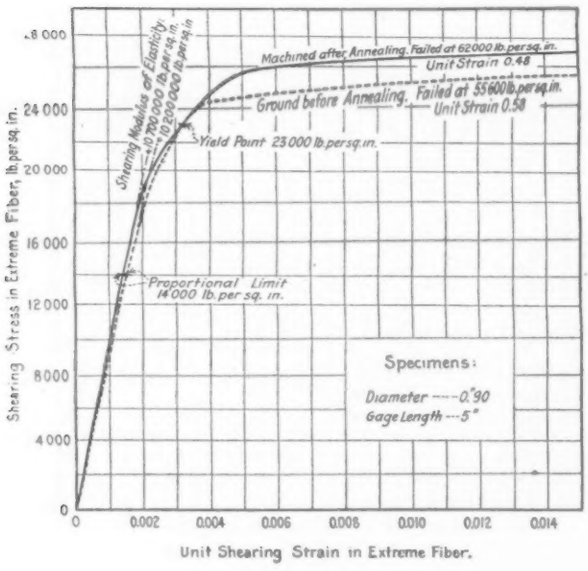

Shearing Stress in Extreme Fiber, lb. per sq. in.
Machined after Annealing. Failed at 62000 lb. per sq. in.
Unit Strain 0.48
Ground before Annealing. Failed at 55600 lb. per sq. in.
Unit Strain 0.58
Yield Point 23000 lb. per sq. in.
Proportional Limit 14000 lb. per sq. in.
Specimens:
Diameter ----0.90
Gage Length ---5"
Unit Shearing Strain in Extreme Fiber.

FIG. 3

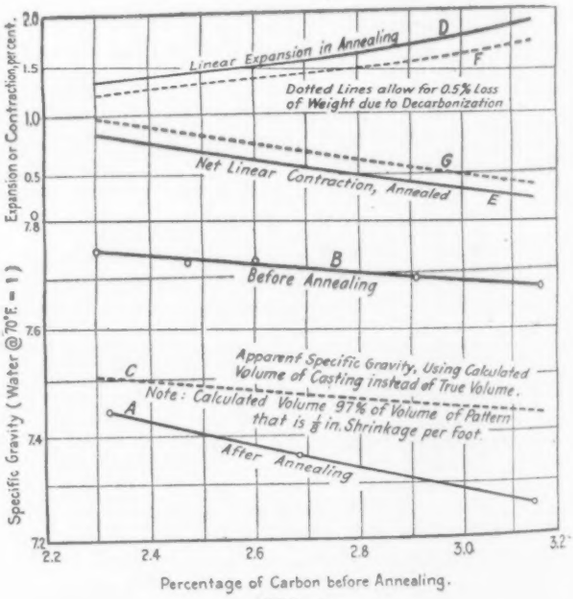

Linear Expansion in Annealing
Dotted Lines allow for 0.5% Loss of Weight due to Decarbonization
Net Linear Contraction, Annealed
Before Annealing
Apparent Specific Gravity, Using Calculated Volume of Casting instead of True Volume.
Note: Calculated Volume 97% of Volume of Pattern that is 1/8 in. Shrinkage per Foot.
After Annealing
Expansion or Contraction, per cent.
Specific Gravity (Water @ 70°F. = 1)
Percentage of Carbon before Annealing.

FIG. 4

Hardness and Density

The Brinell hardness of malleable cast iron has been observed to range from 101 to 145, the average value being approximately 110. Shore scleroscope readings on malleable iron with a Brinell hardness of 102 will average about 15. All attempts made to correlate the Shore and Brinell hardness with machining quality have been entirely without success. The Brinell number varies approximately with the tensile strength, and inversely with the carbon content of the material.

Malleable iron will, of course, vary in density with the percentage of carbon. In Fig. 4, curve *A*, is plotted the variation of specific gravity referred to the carbon content of the original hard iron. The samples from which these data were obtained may be expected to be approximately 0.5 per cent lower in carbon than the original hard iron. The utmost care was taken to avoid any shrinkages, blowholes or other mechanical defects.

In case the density is to be used for the computation of the weight of a casting of a given design, curve *A* is not directly applicable. Malleable castings from a given pattern vary somewhat in size. This variation arises from differences in carbon content and heat treatment. All graphite-free iron castings shrink exactly the same amount. This fact has been very carefully checked by the National Malleable Castings Co. by measurements of the contraction in freezing and cooling of alloys differing much more widely in chemical composition than commercial malleable cast iron could possibly do. The unannealed castings from a

given pattern are always of the same volume. When annealed they expand a variable amount depending upon heat treatment and chemical composition. Therefore, if the original hard iron were always of the same density the variation in specific compensated by the corresponding change in volume, and the weight of the castings would all be the same even though they would be of different dimensions.

The specific gravity of white cast iron varies with its chemical compositions as shown in Fig. 4, curve *B*. These results again are based upon samples known to be free from defects. The dotted line *C* in this figure indicates the specific gravity as referred to the expected volume of the casting made on the commercial assumption that the shrinkage of the white iron would be ¼ in. per foot and that the *net* shrinkage of the malleable casting would be ⅛ in. per foot. This curve, therefore, compensates for that portion of the change in density which is compensated for in weight by a corresponding variation of volume in the casting.

Curve *D* in this figure plots the expansion in annealing corresponding to the differences of density existing between curves *A* and *B*.

Curve *E* is the difference between curve *D* and 2.14 per cent, the observed shrinkage of all white cast iron. This graph is lower than the usual commercial allowance of ⅛ in. per foot corresponding to 1 per cent, but approaches that figure closely for the values of carbon around 2.40 per cent now commonly used.

Curves *F* and *G* correspond to curves *D* and *E* allowing for the decrease in weight by decarburization.

The National Malleable Castings Co. has had occasion to design and build special equipment for the determination of changes in dimensions of castings, both during the process of annealing and while freezing in the mold. In connection with these experiments there have been rendered available figures from which the expansion of malleable iron and hard iron with heat can be obtained.

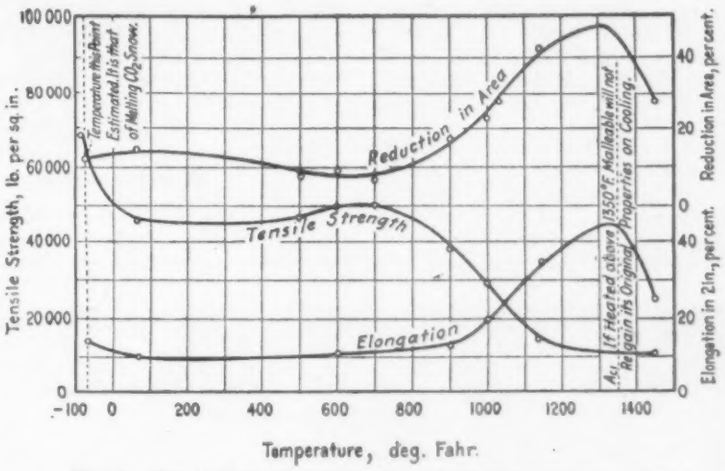


Fig. 5. Effect of Temperature Upon the Tensile Properties of Malleable Cast Iron

In connection with investigations in regard to annealing heat treatments, this company has from time to time determined the critical points of various alloys. Our experiments are not of extreme precision, but for the sake of completeness of results are included here:

Malleable Cast Iron	Hard Iron
Ac_1..1356 deg. F. (735.5 deg. C.)	1350 deg. F. (732.5 deg. C.)
Ar_1..1283 deg. F. (695 deg. C.)	1280 deg. F. (693.5 deg. C.)

Our experiments were not sufficiently sensitive to indicate A_2 and A_3 in malleable iron.

Fig. 5 shows the tensile strength, elongation and reduction in area of malleable cast iron tested at various temperatures. Tests were conducted upon specimens 0.634 in. in diameter, ground to size before annealing. All the specimens were of the same material and of the same heat treatment. The elongation is measured in a gage length of 2 in. The results are known to be unaffected by shrinkage or other defects. The last observation at 1450 deg. Fahr. indicates the change of properties caused by the re-solution of carbon at temperatures above the critical point.

On many of the points we have in our files vastly more information than is quoted here, the material in the present paper being merely a judicious selection.

Discussion by W. R. Bean

THE following contribution is confined chiefly to the more common physical properties or characteristics of malleable cast iron, and is largely data confirming some of the conclusions reached by Mr. Schwartz. These data are the result of investigations carried on by the Eastern Malleable Iron Co. and by the writer previous to his association with that company.

Tensile Strength and Elongation

The specifications now generally accepted for malleable cast iron which are referred to by Mr. Schwartz are being exceeded in routine tests by a very large proportion of the malleable producers and can be readily exceeded with a good margin of safety by all who will take reasonable care in the different stages of the malleable process.

Of possibly greater interest and of more value, however, to the engineer or user of malleable cast iron, is a test conducted the early part of this year on tensile test specimens cut from a heavier section of malleable cast iron than it has been customary to cast.

Table 1 is the test report covering tensile test of nine specimens cut from a casting 3 in. x 3 in. cross section and Fig. 1 shows photomicrographs of the nine tensile specimens, these being arranged in order corresponding to the position of the specimens as cut from the bar as shown. The magnification is 85 diameters. The completeness of the annealing is clearly shown by the absence of combined carbon and in the structure of ferrite and temper of graphitic carbon.

The purpose was to show the similarity in properties, especially tensile test values, of specimens cut from corresponding sections of the bar. It is not our purpose to discuss the process of manufacture in this connection, further than to say that this casting, although 3-in. x 3-in. cross section, was thoroughly annealed without any extra precaution being taken, and that in spite of its heavy section and the fact that all of the skin or outer portion of the test bar was removed in machining, the test values are above or very close to those specified for malleable cast iron where maximum strength is sought. In other words, we have here evidence to disprove two of the common fallacies regarding malleable cast iron.

First—That the strength is mainly in the skin or outer portion, and

Second—That the material is not suitable for castings of heavy section.

We are in position to supply further data or proof in substantiation of our statement regarding the relation between strength and the "skin" or outer portion of malleable iron castings, which data Mr. Schwartz states that he has not in sufficient extent to be conclusive. This we submit in the form of a summary of tests of tensile bars cast in pairs from 58 furnace heats, one bar being tested in the rough as annealed and the other having a finishing cut taken off before testing. In no case was the amount of metal removed less than 1/16 in., ⅛ in. in diameter, and in some of the tests the amount removed was ⅛ in., ¼ in. in diameter,

there being very little difference in proportionate values between bars with 1/16 in. metal removed and those with ⅛ in. metal removed.

The figures, maximum, minimum and average, elongation and tensile strength are given in Table 2.

The minimum elongation occurs on an unmachined bar and there is very little difference in minimum tensile strength, or in fact in any of the test values. The average tensile strength is exceptionally close.

If it occurs to anyone to ask regarding the difference between the test values above and those given in Table 1 we would say that the difference is no greater and we believe a good deal less than in other cast materials from specimens similarly obtained.

Mr. Schwartz emphasizes, and justly so, the fact that malleable cast iron differs from all other commercial iron alloys in that elongation increases with tensile strength. This fact was pointed out a number of years ago by Professor Touceda, we believe, and while we have not undertaken to tabulate the results, we can say that our routine testing of all heats produced proves this to be a fact.

Malleable cast iron in compression is practically indestructible so far as rupture of the surface is concerned, the action being to continually flatten out with no or with very slight indication of rupture on the outer surface.

When test specifications for malleable cast iron were first brought out, including a transverse test on bars of different thicknesses, we included this test in our regular practice, following it for a period of some months, during which time it was developed that malleable cast iron which was not better than fair in tensile properties would readily pass the transverse test specifications. This test was therefore discontinued, and we have not anything in detail to submit, but it is our observation that malleable cast iron is a reliable material under transverse load, and we are disposed to accept Mr. Schwartz's conclusions in this respect.

Hardness and Machinability

During the past year we had occasion to investigate the possibilities of the Shore scleroscope, hoping to establish a connection between this or some similar measure of hardness and machining properties of malleable cast iron, but in this, as in the case of Mr. Schwartz, we were entirely unsuccessful.

Inasmuch as the question of machinability of malleable cast iron is one which enters as an important factor, or rather is given a very prominent place by some users of malleable castings, especially where fine threading or milling is involved, we wish to enter here a plea or protest.

Many users of malleable cast iron wish to obtain in light sections strength corresponding to that of steel or wrought iron, and at the same time wish a material which can be machined as readily as soft gray iron. The two things are not compatible, although it is possible to machine malleable castings of the highest grade

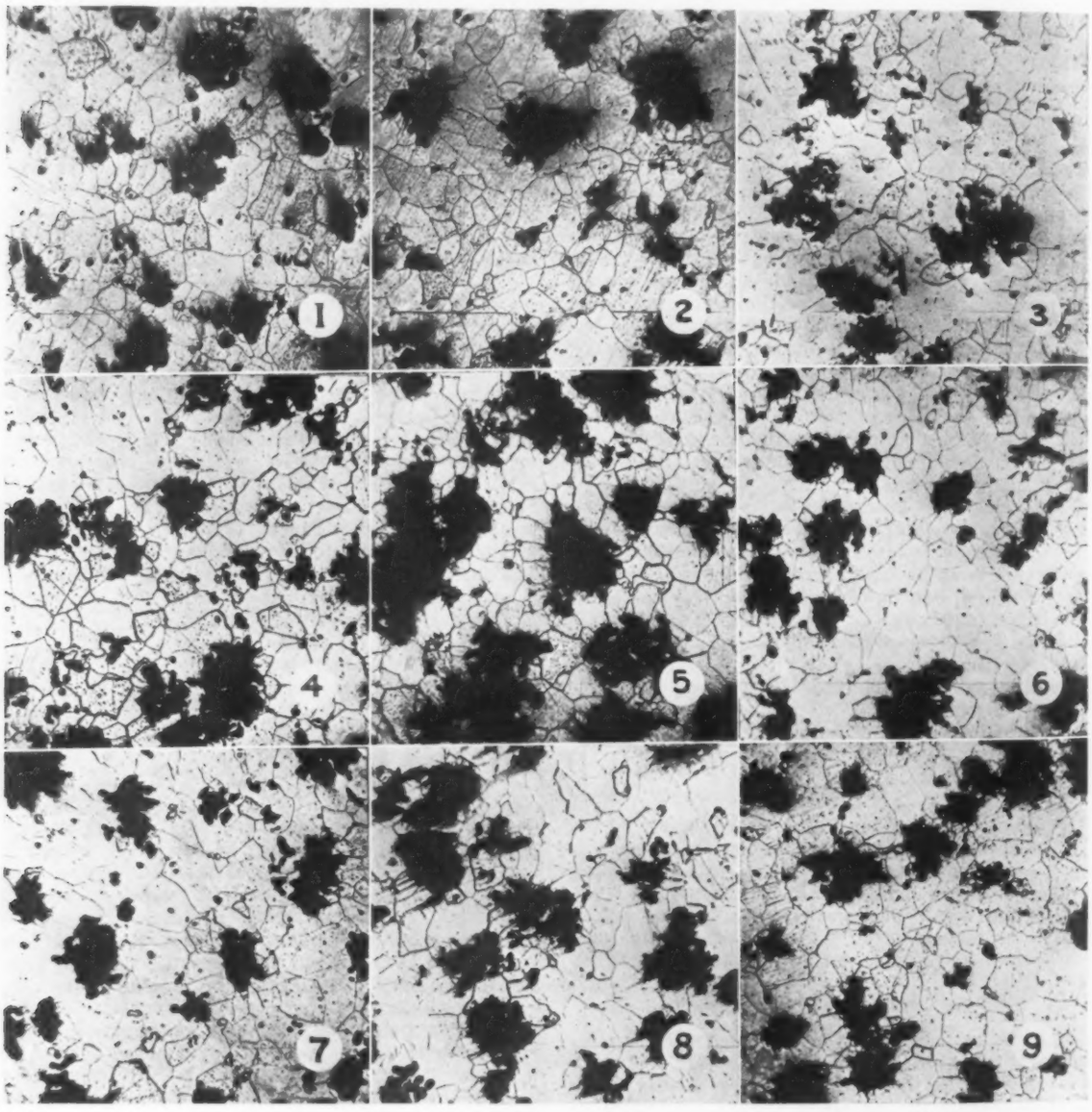


Fig. 1. Photomicrographs of the Nine Test Bars Cut from the Large Bar and Represented by the Results in Table 1

from the standpoint of strength and ductility at cutting speeds not far below those employed in machining gray iron castings. The point we wish to make clear and emphasize here is that for the sake of maximum strength and service something must be sacrificed in machining malleable castings.

Table 1.—Physical Tests of the Nine Bars Cut from One Large Bar

Bar No.	Diameter bar, in.	Elastic limit, lb per sq. in.	Elongation in 2 in., per cent.	Tensile strength, lb. per sq. in.
1	0.749	32,455	12.0	45,914
2	0.750	31,869	10.0	42,870
3	0.750	33,318	10.0	45,450
4	0.750	36,215	10.0	43,866
5	0.750	39,859	9.0	39,859
6	0.750	38,320	11.0	41,489
7	0.750	34,861	12.0	45,835
8	0.750	37,007	11.0	43,707
9	0.750	37,211	13.0	45,631
Maximum		39,859	13.0	45,914
Minimum		31,869	9.0	39,859
Average		35,678	10.8	43,846

Composition of the bars: Silicon, 0.88; manganese, 0.30; sulphur, 0.101; phosphorus, 0.194, and total carbon 2.24 per cent.

Test pieces cut from half of 3 in. x 3 in. x 12 in. test bar.

Bar finished all surfaces to remove outer portion or skin before being cut into test pieces 6 in. long turned to ¾ in. diameter.

Bar was given a normal annealing at moderate temperature and cut into test pieces on shaper with cutting-off tool. Depth of cut 1½ in., proving complete annealing and softness throughout the section.

Mr. Schwartz has pointed out the fact that quality or strength is inversely related to the carbon content, and we make this statement without hesitation. In this connection I recall clearly a series of tests conducted during 1906 and 1907, which brought this fact forcibly to my attention, I at that time being new in the malleable business. It was then accepted as a new development by others taking part in the tests who occupied very prominent positions in the malleable industry.

While our investigations in this field have not been as extensive as those recorded, the writer ten years ago conducted sufficient tests to convince himself and others that in the absence of graphitization in solidifying there was no difference in shrinkage or contraction of the white iron. There is, however, as is pointed out, a slight difference in expansion in annealing, resulting from differences in carbon content and in annealing treatment.

Critical Points in Heat Treatment

About ten years ago the writer, in co-operation with the Taylor Instrument Co., Rochester, N. Y., determined the Ac_1 point in malleable cast iron to be at 1375 deg. Fahr., which agrees closely with Mr. Schwartz's findings. This, however, has been indicated since at a temperature slightly above 1400 deg. Fahr., and as the duplication of the curve provides checks, we believe this to be a more accurate determination.

Through the courtesy of the Leeds & Northrup Co. of Philadelphia we have obtained curves or charts on unannealed and annealed samples of essentially the same chemical composition.

The Ac_1 point was located at 1405 deg. Fahr., and the Ar_1 point at 1375 deg. Fahr. in the unannealed sample. On the annealed sample the Ac_1 point was indicated as at 1420 deg. Fahr., and the Ar_1 at 1340 deg. Fahr., the difference in temperature of the two points being considerably greater than on the unannealed sample.

Table 2.—Physical Properties of Bars Cast in Pairs from 58 Heats

No. of bars	Condition of bars	Maximum: Elongation in 2 in., per cent	Maximum: Tensile strength, lb. per sq. in.	Minimum: Elongation in 2 in., per cent	Minimum: Tensile strength, lb. per sq. in.	Average: Elongation in 2 in., per cent	Average: Tensile strength, lb. per sq. in.
58	*Rough.....	22	58,263	8.00	51,333	12.80	53,259
58	†Machined.....	23	60,060	8.50	50,241	13.20	53,234

*Rough bars ⅝ in. diameter.
†Machined bars ½ in. and ⅝ in. diameter.

Conclusion

We are forced to the admission that even though we might be otherwise inclined, there is very little in the data submitted by Mr. Schwartz, with which we can disagree. The results bring us to essentially the same points, that malleable cast iron is a reliable material when the process is carried out under proper supervision, which happily is now the rule rather than the exception. This condition admittedly did not prevail up to a comparatively few years ago.

Summary of Research Work Done by Enrique Touceda

ENRIQUE TOUCEDA, in his voluminous paper, presents an account of four years of research work undertaken for the American Malleable Castings Association as a plea for industrial research among manufacturers and as a striking example of what such research can accomplish. He sketches the organization and purpose of the association and shows how the quality of product of its members has steadily increased since the beginning of the research work. Malleable-iron castings, due to lack of uniformity and dependability, were rapidly being replaced by other materials. There were many fallacious ideas and theories regarding the physical properties of such castings and the methods of annealing them. Records of tests of 1-in. bars from seven different concerns made by the author in 1911 showed that the average ultimate strength was 39,882 lb., and the elongation under 5 per cent. A report dated March, 1919, to the members of the association, each of whom regularly submits test bars from some one heat of each day's runs, showed that 44 per cent of the test bars submitted during that month had an ultimate strength over 52,000 lb. and an elongation of 14.67 per cent, indicating the process made since research work was undertaken.

It is further stated that the average of test bars of the association from Jan. 1, 1917, to March 31, 1919, has shown an ultimate strength of 51,000 lb. and an elongation 12.5 per cent. The records of tests show, contrary to generally accepted theory, that the elongation increases with the ultimate strength. The purpose of the association, however, is not to increase ultimate strength and elongation, but to increase the uniformity of a product upon which the engineer can rely, and this is being accomplished through exhaustive research and advice to members through the consulting engineer of the association.

A description is given of the process of manufacturing malleable iron, of the air furnace, and of the annealing ovens and the annealing process. The structures of iron containing free carbon and iron containing combined carbon are shown by micrographs, and the metallurgy of cast iron is carefully explained with abundant micrographs of typical structures.

The effects of the time element in cooling through the critical temperature of successive anneals, of varying percentages of carbon, sulphur, silicon, phosphorus and manganese and of subsequent heating to high temperatures are clearly described and illustrated. Picture-frame fractures are also discussed.

The author closes by exploding three popular theories with regard to malleable iron. He shows that the strength of malleable iron is not confined to its skin, but that this may be machined off without destroying strength, if the quality of the iron is as it should be. Secondly, he shows that it is possible to eliminate the carbon throughout the entire specimen and not merely near the surface. Lastly, he shows that thick as well as thin castings can be annealed successfully.

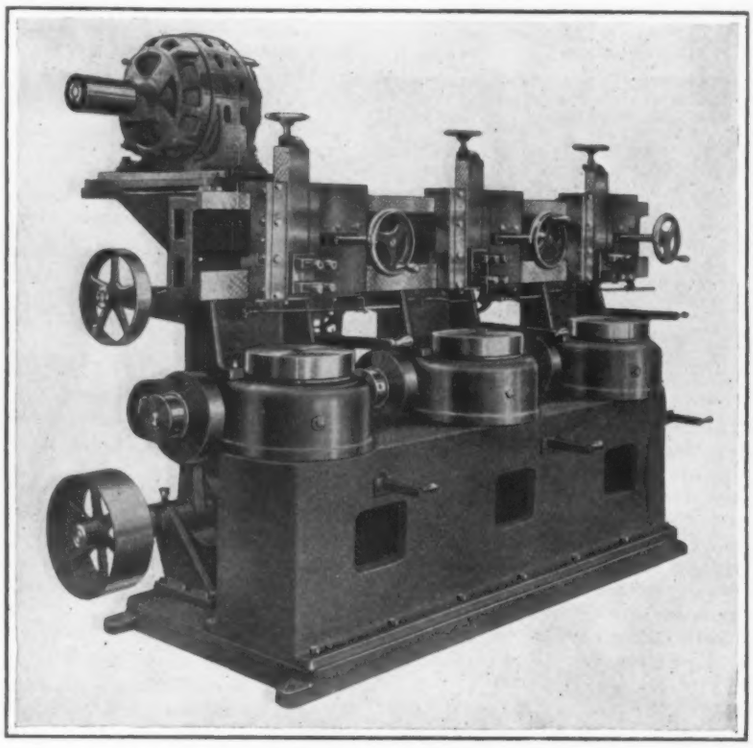
Vertical Gang Lathe

The vertical gang lathe illustrated is a recent product of the Moline Machinery Co., Moline, Ill. This machine was originally designed for the facing of pipe flanges, but is adaptable to other uses. With the exception of the base, housing and rail the machine is built in duplicate units, each having independent control of speed and feed, as many units being used in gang as can be conveniently handled.

The main drive is through a three-pitch spiral pinion and bronze gear, giving a total reduction of 12 to 1 from driving shaft to table. A further reduction can be obtained from motor or countershaft to the driving shaft. The feed is through worm gearing, rack and pinion. A horizontal feed is shown in the illustration but vertical and angular feeds can be furnished.

The rotating table is patterned after standard boring mill construction with a 90 deg. V, as well as a trunnion bearing. Adjustments for wear are provided.

The table is 13½ in. diameter and has a swing of 16 in. The travel of the saddle on the rail is 7 in. and the vertical travel of the tool head 5 in. The height of the table is 38 in. and the distance between units 36 in.



Vertical Lathe Built in Duplicate Units, Each Having Independent Control of Speed and Feed

Concrete Columns Reinforced with Cast Iron

WASHINGTON, Aug. 19.—Interesting comparison of the relative strength of steel reinforced columns and similar columns reinforced with cast iron have been made by the Bureau of Standards. The tests were made in the Pittsburgh laboratory on 18 columns, made by L. J. Mensch, construction engineer of Chicago.

Concrete columns reinforced with cast iron have been in use abroad for several years, but the Bureau's tests are the first use of this type that have been made in America. This gives the tests a special importance. The following is an abstract from the report on the tests made by the Bureau:

These columns were 12 in. in diameter (inside 1⅛-in. pitch, 8-gage wire spiral) and were reinforced longitudinally with steel rods and cast iron tubes. The cast iron tubes located in the center of the columns varied in outside diameter from 5 to 7 in. with wall thickness of ⅝ to 1 in. The column lengths varied from 6 to 14 ft. Tests were made on samples of the cast iron; also on the concrete used which was proportioned by volumes and consisted of one part cement, one part sand, and two parts gravel, hand mixed.

The behavior of these columns under loading was similar to that of the ordinary type of steel reinforced columns. Incipient failure was in all cases accomplished by scaling of the outer shell which finally spalled off at the surface of the spiral. This was followed by failure in tension of the spiral reinforcing at the maximum load sustained by the column.

The maximum strength of the column is not quite equal to the strength of the cast iron reinforcement tested independently plus the strength of the usual type of spirally reinforced column. The cast iron reinforced column has, however, a much less area of concrete.

The columns commenced to scale at 70.4 per cent of the maximum load. Two columns of the same series without cast iron commenced to scale at 89.9 per cent (average) of the maximum. The average maximum total load sustained by the various types reinforced with cast iron and of the same length (10 ft.) as the two plain spiral reinforced columns was 81.5 per cent greater than was sustained by the plain spiral columns. Filling the hollow core of the cast iron tubes apparently adds 6500 lb. for each square inch of cross section thus filled. Varying the radius of gyration of the cast iron tubes, the net cross section area remaining constant, does not apparently affect the ultimate strength of the column. Cast iron I sections were used instead of tubes in two of the columns, the results comparing favorably with the tube columns having the same percentage of cast iron.

The following formula which incorporates the relationship for variation of strength with length is derived from these tests:

$$\frac{P}{A} = 12{,}150 - 20\,l, \text{ in which}$$

P = mean stress upon total area of column inside the spiral; A = total area as above; l = length of column in inches.

In view of the general behavior of spirally reinforced columns just preceding failure it is suggested that a superior type might be developed if the protective shell outside the spiral were applied after the column has been cast and the forms removed. This shell should be of some material possessing the necessary heat insulating qualities and the ability to withstand without failure a considerably greater strain than .0015 (the strain at which unreinforced concrete fails). This method of construction would also make possible a much greater accuracy in the placing of the spiral.

The complete report of these tests contains numerous tables, photographs and diagrams with a discussion of the design of the columns and the results obtained. O. F. S.

The General Combustion Co., Chicago, manufacturer of industrial furnaces and equipment, has organized a Canadian company to sell the "Oilgas" furnaces. The offices of the new company are in the New Birks Building, Montreal. The following are the officers: Dr. Milton L. Hersey, president; William T. Dean, first vice-president; Max Sklovsky, second vice-president; P. J. Woolf, secretary and treasurer; Norman M. Campbell, managing director. H. H. Vaughan, vice-chairman Canadian Engineering Standards Association, is on the board of directors.

Present-Day Labor Problems at Detroit

Mr. Gompers's Views on Prohibition Effects Not Borne Out—Favorable Experience with Employee Representation

(Editorial Letter)

DETROIT, Aug. 15.—This beautiful city is busy, prosperous and dry. I say this in spite of the fact that some men who do not want to work are idle, some lines of business are not as prosperous as others and it is still possible to get drunk.

On the 3d of July President Gompers of the American Federation of Labor laid before the United States Senate Committee on Judiciary what purported to be documentary evidence that prohibition was breeding Bolshevism in Detroit. "The industrial situation in Detroit," said Mr. Gompers, "owing to the spread of radicalism and the deadly doctrines of the I. W. W. and revolutionists, is acute and charged with danger. Oppressive legislation begets radical propaganda, and should Bolshevik doctrines ever obtain a foothold in this nation—which God forbid—the prohibitionists will not be free from responsibility." Mr. Gompers said that as soon as prohibition was ushered in I. W. W. organizers invaded Detroit, opened headquarters and started to carry on their campaign. When he spoke, prohibition had been in effect more than a year, and six weeks have passed since he made his sensational declaration. Certainly if the I. W. W. and other agitators were making progress there would be some evidence of it at the present time. Careful investigation shows that there was very little foundation for what Mr. Gompers said and that the industrial situation has been vastly improved by prohibition.

Substitutes for Liquor

Let it not be concluded by anyone that the liquor question has been entirely solved in Michigan. One man whom I questioned was originally a workman in a factory. He later had extensive newspaper experience and is now closely allied with the business interests of Detroit. He gave me some very interesting facts about the substitutes for whiskey and beer, particularly as to the use of dandelions, blackberries and other berries and raisins in the homes of working people. "Among the iron molders and others who work in hot places, there is," he said, "a conviction that they must have something to drink. They have drunk large quantities of beer for years and now they are using substitutes. Whiskey can be had, if one knows where to find it, at about $12 per quart. Dandelions are used for some sort of concoction which they say has an awful 'kick' in it. Berries are made into wine and raisins in large quantities into brandy. So common report is that these men who have hard jobs are drinking a good deal. As to statistics, they are not very valuable, but it should be remembered that the police are much more strict than they were before prohibition was inaugurated. In the rural districts, the question is solving itself and cider is being used extensively as a substitute. However, in spite of what I have told you, I do not hesitate to say that on the whole conditions are improved by prohibition."

Statistics as to Arrests

So much for one who sees pretty fully the wet side of the question. Although, as he says, statistics are not infallible, it is worth while to look into the facts about arrests. When the saloons were in existence, the police were rather lax in making arrests, but now anybody who is at all intoxicated is locked up for the sake of getting evidence as to where he obtained his intoxicant. While under prohibition there has been a decided falling off in arrests, Detroit cannot say, as was reported from Columbus, Ohio, the other day, that the city prison is empty. But for the first year of prohibition ending last May, the arrests in Detroit for felonies were 6318, compared with 10,299 for the preceding year of licensed saloons. Arrests for miscellaneous offenses were 22,963 in the dry period, compared with 43,658 in the wet period, while arrests for drunkenness were 4032, compared with 11,279.

No exact statistics are available as to recent absenteeism and tardiness of employees in industrial plants, but for a number of months following the beginning of prohibition an effort was made by the Employers' Association of Detroit to get statistics along these lines and it was perfectly clear that a decided improvement had taken place. Later, other elements contributed toward labor turnover and irregularities and made it difficult to obtain statistics that were of any value. Employers ridicule the idea that prohibition is responsible for Bolshevism or any other kind of radicalism. They say that Detroit has had almost no trouble with the radicals. It has, however, had some serious strikes, and this brings me to the consideration of the efforts which have been made in Detroit to introduce shop committees.

Shop Committee Troubles

This plan has had some severe jolts, especially in two large plants, but employers and others who are earnest advocates of extending democratic methods to industry are positive in saying that the experience of Detroit has by no means proved that shop committees and representative plans of industrial management will not succeed. The main bone of contention in Detroit has been as to the method of electing shop committees. In one case, that of the Wadsworth Mfg. Co., which manufactures automobile bodies and accessories for the Ford Motor Co. on an extensive scale, the principal point at issue was whether the shop committee should be chosen within the plant or outside of it. The strike continued for months, and a few days ago the plant was destroyed by fire. Naturally a suspicion of incendiary origin was entertained, but the company states that that was not the case and such evidence as there is supports its assertion.

At another plant where there were about 12,000 men employed, that of the Timken Axle Co., shop committees had been organized and were in operation within the plant, but the union insisted upon forming committees outside to supplement or take the place of the other committees. The company refused to grant this demand and a strike resulted but failed to more than temporarily stop operations, and the plant is now a very busy place. The company continues its shop committees.

George W. Grant, secretary of the Employers' Association of Detroit, takes a very optimistic view of the labor situation. As to the various ventures in democracy that have been made, he strongly emphasizes the point that in order to make them succeed the men must be consulted in their formation. He says that if a company formulates a plan according to its own notions and thrusts it upon the men or merely goes through the form of asking their approval, it is very likely to be a failure. If, however, the men are consulted, their views fully obtained, their votes recorded, and the right spirit is shown by the employers, much good is almost certain to result and in time entirely satisfactory plans can be worked out.

Henry Ford and His Company

A letter from Detroit without some reference to Henry Ford would hardly be complete. The people of this city differ from those in other parts of the country in their attitude toward Mr. Ford principally in being more interested in him and his enterprises. He has many admirers and also many critics, but few, if

any, bitter enemies. The progress of his libel suit against the Chicago *Tribune* has been closely watched and most people are glad that the practice of calling names by newspapers has received a rebuke. One hears many kindly remarks about Edsel Ford, whose failure to go to college and to war is attributed entirely to his father's influence. Now that the Fords have complete control of the Ford Motor Co. Detroit is wondering what the next development will be. Some amazing figures are leaking out as to how the original investors in the company stock are receiving checks for the stock which they recently sold. For example, one man who invested $5,000 when the company was organized received a few days ago a check for $13,000,000. G. S.

Interpretations of French 8-hr. Law

WASHINGTON, Aug. 20.—Ambassador Wallace at Paris has sent to the State Department an official interpretation of the French 8-hr. law. The application of this law caused a crisis in the French Parliament, but the Clemenceau government won a vote of confidence. The law itself was couched in general terms, leaving the administrative regulations to be worked out later. As a result there have been conflicts concerning its particular application. The interpretation sent by Ambassador Wallace is a summary of a circular issued by M. Colliard, minister of labor and social welfare.

According to this summary the law is to be applied, in general, to all workmen and employees of commercial and industrial enterprises, including mining enterprises (which were not specifically mentioned in the law), and to all classes of public employees, but is not applicable to agricultural laborers.

The duration of work fixed by the law is understood to be the duration of effective work, and does not include rest periods. The law limits the daily hours of work to 8 and the weekly hours to 48, but provides for "any other equivalent limitation." It is understood that in some forms of work, e.g., of railroad labor, the 8-hr. day is not practicable, but no "limitation" can be considered within the meaning of the law if the average day's work is more than 8 hours.

The maximum of working hours may be fixed either by day or by week. If it is fixed by the week, a regulation must be made distributing the 48-hr. over the various days of the week. In this way, for example, Saturday half holidays may be provided.

It is lawful for employers and workmen to agree on a maximum number of hours which is less than that prescribed in the law. The law shall be considered as contravened only when the maximum is greater than 48 hr. per week.

Public regulations may confine themselves to fixing the number of effective working hours for each day; but they may likewise apportion those working hours throughout the day, providing for and fixing the times of rest periods; and they may fix the time of beginning or of ending work.

The law provides for two kinds of derogations, permanent and temporary. Permanent derogations allow the maximum hours to be exceeded in a permanent manner, and may be applied in instances in which the nature of the work is such that it must be performed outside the regular fixed hours, or when the labor performed is essentially intermittent in character. Examples of the latter sort comprise gatekeepers, railroad station agents on lines little frequented, etc.

Provision is made for temporary derogations in times of national necessity, of unexpected or imminent accidents, and for extraordinary additions of work such as sometimes occur in rush seasons. It is left to the regulations of the public administration to determine for each industry or trade the maximum of temporary derogations permitted and the nature of such derogations.

In complying with the provisions of the law any reduction of hours from a previous normal day's labor shall not be accompanied by a reduction in day's wages.

Finally, it is declared to be the policy of the Ministry of Labor and Social Welfare to encourage the establishment of better facilities for the profitable use of the additional leisure which workpeople will have as a result of the new law. Specific recommendations include the creation of courses of study for apprentices in various trades, and in some instances for adults; the opening of reading rooms and libraries, encouragement of gardening, and increase in the number of pleasure grounds.

Emigration from Canada

WASHINGTON, Aug. 19.—The fear of a "flood of emigration" seems to have struck Canada. So far, no figures are available to demonstrate whether it is based on actual facts or propaganda. Consul Felix S. S. Johnson, at Kingston, Canada, has made a report to the Bureau of Foreign and Domestic Commerce, as follows:

"Canadian manufacturers are beginning to realize what influence the steady stream of emigrants from Canada back to Europe will have on factory production. Ever since it became possible for these men to get boats home they have been leaving in hundreds. With business resuming normal conditions and factories trying to speed production to supply markets that are bare, the alien is becoming conspicuous by his absence. A large Canadian manufacturer stated that he did not know how he was going to obtain unskilled labor. Scores of the men who have gone home to visit relatives from whom they have not heard for five years, did all kinds of hard, heavy work that Canadian workmen will not touch, no matter what wages are offered. Although they were unskilled, the work of these aliens was very necessary and not a few firms requiring manual labor are looking over their thinned ranks and wondering just how they are going to handle the orders that are coming.

"The situation indicates that production may be greatly delayed and that orders are likely to remain unfilled because manufacturers will not have the unskilled help to get the work out as rapidly as usual. No branch of industry will be hit harder, it is stated, than the metal trades, because of the large amount of heavy work involved."

Reduced Rates to South America

WASHINGTON, Aug. 19.—Reductions averaging $5 a ton have been made by the Shipping Board in ocean rates on iron and steel articles from United States Atlantic and Gulf ports to South America. The new rates, which were announced to meet British competition, follow:

Para, Maranhao, Ceara and Manosa, Brazil.—$17.50 per gross ton, landed.
Natal, Brazil.—$20 per gross ton landed; $17.50 F. F. A.
Cabadello, Brazil.—$22.50 per ton, landed; $17.50 F. F. A.
Pernambuco, Brazil.—$22.00 per ton, landed; $20 F. F. A.
Maceio and Rio de Janeiro, Brazil.—$21.50 per ton, landed; $20.00 F. F. A.
Bahia and Victoria, Brazil.—$22.50 per ton, landed; $20.00 F. F. A.
Santos, Brazil.—$20.00 per ton, landed.
Paranagua, Brazil.—$25.00 per ton, landed.
San Francisco do Sul and Florianopolis, Brazil.—$25.00 per ton, landed; $23 F. F. A.
Rio Grande do Sul, Brazil.—$25 per ton, F. F. A.
Porto Allegro and Pelotas, Brazil.—$30 per ton, landed.
Montevideo, Uruguay, and Buenos Aires, Argentina.—$20 per ton, landed.
La Plata, Argentina.—$22.50 per ton, landed.
Rosario, Argentina.—$25 per ton, landed.
Bahia Blanca, Argentina.—$30 per ton, landed.
Port Madrin, Argentina.—$35 per ton, landed.

These rates include plain wire. Rates on barbed wire are $2.50 additional, except in the case of Bahia Blanca and Port Madrin, where the rates are $5 additional.

COMPOSITION OF ELECTRODES

Effect of Chemical Composition on the Physical Characteristics of the Weld

In order to obtain information as to the effect of the chemical composition of an electrode on the welded material in electric arc welding tests were recently made by the Wilson Welder & Metals Co., Inc., 2 Rector Street, New York. Two electrodes of widely different chemical analyses, 0.148 in diameter were selected and their composition determined. The analyses were as follows:

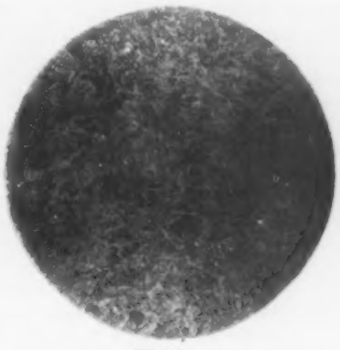
	C	Mn	P	S	Si
R wire	0.17	0.57	0.007	0.028	0.14
W wire	0.39	1.01	0.005	0.024	0.12

The silicon constant was rather high, but inasmuch as it was fairly constant in both electrodes the results are comparative.

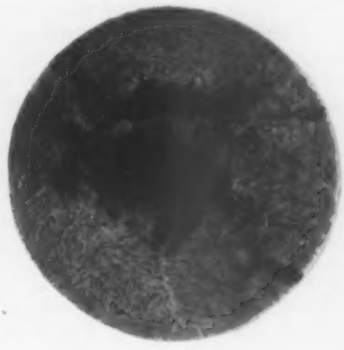
A deposit was then made by a metallic arc, welding approximately 1 ft. long, 6 in. wide and 1 in. thick, on a ½-in. plate. The welding machine had a constant voltage of 37 volts at 130 amperes. The plates used for depositing the first layer were machined away and two test bars were made from each electrode, composed entirely of welded material. The ends were rough machined and about 4½ in. in the middle of the specimens were finished carefully as shown. The physical characteristics of the plates were as follows:

	Tensile Strength	Elastic Limit	Elongation	RA	Brinell
R-1	57,300	43,400	8.0	15.3	147
R-2	56,050	50,500	6.0	5.9	132
W-1	76,200	64,000	7.5	13.0	194
W-2	72,650	60,260	5.5	7.1	188

R-1A



W-1A



R-1B

Fig. R-1 A. General Structure of Plate Welded with R Electrode. The large growth and columnar structure are characteristic of electric welds. 150 dia.

Fig. W-1 A. Structure of Plate Welded with W Electrode. The grain structure is comparatively small and apparently better than that in Fig. R-1 A. 150 dia.

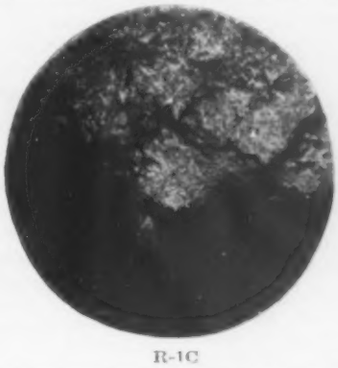
Fig. R-1 B. Specimen Cut from Plate R-1 and Bent to an Angle of 10 Deg. The welded material has opened up adjacent to the slag inclusions. 150 dia.

Fig. W-1 B. Specimen Cut from Plate W-1 and Bent to an Angle of 10 Deg. The welded material is opening up around the slag inclusions, but not to as great an extent as in Fig. R-1 B. 150 dia.

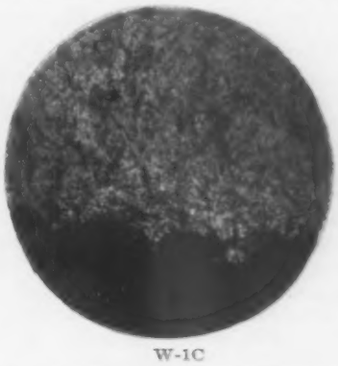
Fig. R-1 C. Profile of the Fracture from Sample R-1 After Bending Through an Angle of 15 Deg. 100 dia.

Fig. W-1 C. Profile of the Fracture from Sample W-1 After Bending Through an Angle of 17 Deg. 100 Dia.

W-1B



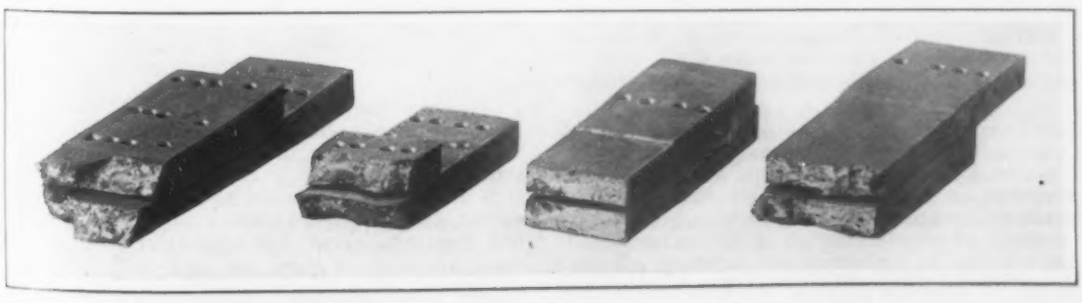
R-1C



W-1C

After these bars were pulled, chemical analyses were taken at the points indicated by the letters on the test bar. The results were as follows:

	C	Mn	P	S	Si
R-a	0.12	0.23	0.012	0.019	0.10
b	0.09	0.24	0.016	0.014	0.08
c	0.11	0.26	0.014	0.020	0.08
W-a	0.23	0.84	0.014	0.012	0.02
b	0.20	0.80	0.014	0.014	0.05
c	0.20	0.88	0.013	0.013	0.02



Test Bars Taken from Welded Sections Made with Two Welding Rods of Widely Different Chemical Compositions. The two outer specimens were from the same weld, made with an electrode having 0.39 C and 1.01 Mn, and had a tensile strength of 76,200 and 72,650 lb. respectively. The electrode used for the two center specimens had an analysis of 0.17 C and 0.57 Mn, and tested to 57,300 and 56,050 lb. respectively.

Photographs of the different fractures are shown. Reading from left to right, the fractures are of bars W-1, R-1, R-2, W-2. Bar W-1, which gave the highest

tensile strength, shows 100 per cent metallic structure with a silky appearance; R-1 shows a coarse intergranular fracture; R-2 shows a brittle, shiny crystalline fracture with a slag inclusion at the lower left hand and upper right hand corners of the bars; W-2 shows partial crystalline and partial silky fracture. At the extreme right there is a portion which is not welded. This is probably the reason why W-2 did not pull as much as the other. Undoubtedly next to the chemical analysis, the quantity of slag in the weld has the greatest bearing on the tensile strength.

The structure of the test specimens are shown in the microphotographs. In making these photographs, a complete micro-analysis of the two different specimens was not sought, the intention being to show the general difference in structure between the two types of electrode. All of these photographs were taken at 150 diameters except the last two, which were taken at 100 diameters.

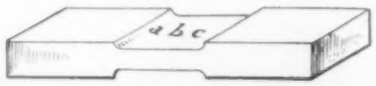
Fig. R-1A shows the general structure of the plate welded with the R electrode, the large grain growth and columnar structure being characteristic of electric welds. Fig. W-1A of the plate welded with the W electrode, shows the grain structure to be comparatively small and apparently much better than that in Fig. R-1A.

Fig. R-1B shows a portion of a test specimen which was cut out of plate R-1 and bent to an angle of 10 deg. It is interesting to note here the opening up of the welded material adjacent to slag inclusions. Fig. W-1B shows a portion of a small specimen cut out of plate W-1 and bent to an angle of 10 deg., the same as in the case of Fig. R-1B. The welded material is opening up but not in the same degree around the slag inclusions as in Fig. R-1B.

Fig. R-1C is a profile of the fracture of sample R-1 after being bent through an angle of 15 deg Fig. W-1C is a profile of sample W-1 after bending through an angle of 17 deg.

The conclusions deduced from the tests are as follows:

It seems just as important to specify chemical composition of the electrode used in electric arc welding as it is to specify the chemical composition in ordering any other type of steel.



Test Bar Composed Almost Entirely of Welded Material

Chemical composition seems to effect the physical properties in electrodes as well as other steel.

An excess of manganese seems to be needed in the electrode.

The relation between the carbon and manganese of an electrode should be approximately one to three.

High carbon manganese wire tends not only to improve the weld on account of the amount of carbon and manganese in the welded material, but also on account of the type of structure which this wire lends to the deposited metal.

There is a smaller amount of oxide and slag inclusions with a high carbon manganese wire than with a comparatively low carbon manganese wire.

Reorganizing American Engineering Standards Committee

WASHINGTON, Aug. 19.—Government officials are vitally interested in the work which is being done to revise the constitution of the American Engineering Standards Committee. At present that committee is made up of the representatives of the American Society for Testing Materials and the societies of civil engineers, mechanical engineers, electrical engineers and mining and metallurgical engineers, and three Government departments—War, Navy and Commerce, thus giving the Government three-eighths of its makeup. The present constitution provides that outsiders can be admitted only by the unanimous vote of the committee. The Government officials insist that it must be broadened to permit other organizations to secure representation, particularly such as the automotive engineers, who are vitally interested in standardization.

At a meeting held in New York last week a special committee was appointed to work out a final plan for such changes, to report Sept. 15. That session was attended by C. LeMaistre, secretary of the British Engineering Standards Association, who told of the eighteen years of work of that organization. It also began as did the American committee with a small exclusive membership, but found it impossible to accomplish anything until it broadened out to include all lines of work. Mr. LeMaistre is to work with the American committee to help frame a reconstruction plan.

The Government's interest in this standardization plan has been increased by the request made to Congress last week by Secretary Redfield for an additional appropriation of $50,000 "to enable the Bureau of Standards to investigate and report upon the need for and methods of standardization in the industries, to promote economy in production and increased efficiency in the use of products through the standardized and measured control of industrial processes and the utilization of the most suitable materials in such industries, and to enable the Bureau of Standards to disseminate such knowledge in such manner as the Secretary of Commerce shall deem most suitable."

The request was made in connection with the Government's campaign against the high cost of living. In asking for the appropriation Dr. S. W. Stratton, director Bureau of Standards, wrote Secretary Redfield:

"Standardization will reduce cost of production in many ways, since its whole object is to sum up technical knowledge in each line and supply it directly to manufacturing. Standardization reduces the number of staple grades by eliminating less useful; it reduces the serious wastes due to inadequate or inaccurate data; it makes ascertained suitability the test of quality and provides the technical methods of inspection and test required to secure a standard output. In short proper standardization is the most approved and successful method of insuring maximum utility at lowest cost, which in the present emergency is the critical problem."

The committee appointed at the New York session consists of Prof. Comfort A. Adams, president of the standards committee; H. N. Latey, E. B. Rosa, of the Bureau of Standards, and C. L. Warwick, secretary of the A. S. T. M. There has been a wide divergence in the organization concerning the proposed changes, but only a minority has insisted upon the retention of the present requirements that outside organizations be admitted only by a unanimous vote and that changes in the constitution require the same vote. The likeliest compromise seems a proposal to substitute a three-fourths vote.

In an editorial on "Prices and Production," the Engineering Supplement of the *Times*, London, says "that far more wealth is probably lost through restricted output than is claimed in increased wages. It is not certain at present how far the industries concerned can pay the advances of wages that are or will shortly be asked; but what is very certain is that these advances, if they are paid, will have to come mainly from increased production, the promotion of which is therefore of more use to workers than even the immediate grant of increased pay. What all parties to industry will be compelled by inevitable circumstances to realize is that no source exists to pay advanced wages or even to maintain employment except actual production."

Reviews British Industrial Conditions

A. C. Cook of the Warner & Swasey Co., Cleveland, on Great Britain's Reconstruction Problems—Labor, Costs, Exports and Railroads

EARLY this year A. C. Cook, general manager of sales, Warner & Swasey Co., Cleveland, Ohio, spent several months in Europe making a survey of the industrial situation for his company. His visit abroad was not his first. At different times he has been in European countries, including Germany, before the war. On one trip he spent several months in England, making his headquarters with Charles Churchill & Co., the British machine-tool house. His connections and knowledge of European affairs thus gained lend added interest to his observations made during his last stay abroad. Some of these, written in April and May, Mr. Cook has made known to THE IRON AGE and excerpts are given herewith. Following are some of his statements as to facts and conditions he found in England. Next week others dealing with France will appear:

By Government order British machine tool makers were compelled, during the war, to paint their machines with a "standard" paint of dirty red color, which was known as "war finish." They were not permitted to fill the castings, being allowed only to clean them of the sand. This accounts for the stories of British machines in Continental factories being painted red to make them distinctive. During 1916, 1917 and 1918 no machine tools were exported from England.

Wages in Machine-tool Shops

In 1914 the British machine-tool output was valued at $20,000,000, while in 1917, on the same basis of figures, it reached $32,500,000, the remainder of requirements being imported. To March 1 prices had increased an average of 55 per cent, most of which took place before the Government relinquished control of the industry. When control was relinquished prices of some machines were advanced further. It is stated that official figures give the 1914 German output as $82,500,000 and for 1917 as $100,000,000.

Wages in machine-tool shops have increased greatly. In 1914 the day rate of the Amalgamated Society of Engineers (the machinists union) was $9.12 for a 55-hr. week, plus a bonus (most shops being operated on the bonus system). As nearly all shops work with the union, this rate was the standard for practically the entire trade, varying slightly in different localities with the cost of living. After conferences, the Employers' Federation and the Amalgamated Society of Engineers agreed upon a day rate of $11.04 per week, plus the bonus, this latter being figured on the old rate of $9.12; i.e. the bonus times were left unaltered. During the war the Government forced the employers to reduce the working hours to 47 per week, and to raise the day rate to $16.08 per week. To this amount was added the bonus (averaging 30 per cent) based on the $9.12 rate, and an additional 7½ per cent (on the total of the day rate and bonus), this latter also being forced by the Government. This gave an hourly rate of 43c. and a total of $20.21 as the total wage for a 47-hr. week. Each shop set the production time for its own work, and the 30 per cent was the average. Tool-makers are paid a slightly higher weekly rate and receive the same bonus as machinists. Overtime must not exceed 8 hr. per week, and is paid for at time and a quarter.

The wage increases were usually given in 1½ per cent raises, and for each five of these, totalling 7½ per cent, the makers were allowed 4 per cent increase in prices. Originally, manufacturers were permitted to make the same percentage of profits as in either 1912 or 1913, where this profit was reasonable. Experts were sent to some shops to examine costs and prices and manufacturers were allowed to make increases (in addition to the above) if warranted.

The 7½ per cent bonus added by Government orders may be taken off, but if so, the day rate may have to be increased to make up for it. Prices probably cannot be reduced in any machine-tool line.

There is some sentiment among machine-tool makers for a protective tariff on imported machines, and it seems probable that a small duty—say 10 or 15 per cent—may be put into effect within a year. These manufacturers feel that British machine tools are as good as American machines and that on an equal basis they can easily compete, but they resent the fact that America has a tariff against them.

It is practically decided to hold a machine tool exhibition at Olympia, London, in 1920, similar to that held in 1912. The details are not yet decided.

War Conditions in Iron and Steel

During the war England almost doubled her steel-making capacity. In order to keep down the prices of pig iron and steel, the Government paid from Jan., 1916, to May, 1919, subsidies amounting to $243,000,000 on iron ore, coke and pig iron; amounting on the pig iron to about $12.50 per ton. This subsidy followed wage increases to miners and railroad men. The control of the industry was in the hands of the Government, but the control and the subsidies were both withdrawn May 1, 1919. The controlled price of Cleveland pig iron was $23.75 per ton, but it is now quoted at $35. In other sections the increase ranges from $16 to $20 per ton. Thus while the price of American iron has been reduced 22 per cent, the English price has been increased 25 per cent on the average. Even so, very few producers are quoting far ahead, as they are not sure of future prices, and the producers have agreed to specify in quotations that iron shall be invoiced at prices in effect at time of shipment. Prices now are approximately 2¾ times the 1914 level, but it is assumed that these high prices are not likely to curtail consumption. A number of sellers, in making contracts, figured on the withdrawal of the Government subsidy, so buyers expected the increases, and planned accordingly. No sudden reduction can be expected, particularly while living costs are at their present height.

England produces two-thirds of the iron ore she uses, and imports the remainder, principally from Spain and Sweden. There is some talk of developing further the iron deposits of the Empire. A policy of Imperial preference has been decided upon by the Government, and imports of iron ore from the Colonies would come in either free or at a very low rate of duty.

On March 15 the Ministry of Munitions had on hand in the United Kingdom 80,000 tons of pig iron and 70,000 tons of shell steel billets suitable for re-rolling, in addition to 70,000 tons of billets in America and 168,000 tons of steel in different forms in Canada. All this was to be shipped to Great Britain and placed at the disposal of steel makers for re-rolling or for scrap except where the American and Canadian stocks could be more advantageously disposed of where they were. At present there is a shortage of scrap.

Some rolling mills are changing from the former 12-hr. shift to an 8-hr. shift, and report an increase per hour of 20 to 30 per cent in production.

During the war wages in the steel industry have been increased about 100 per cent, and hours reduced about one-third.

Japan Gaining Export Trade

A great deal of England's prosperity has always come from her export and re-export trade. With all her industries for the last four years turned over to the making of war material, it is not surprising that markets which she formerly looked upon as distinctly her own are now being supplied by America and Japan.

Her former low costs enabled her to quote prices which no competitor could touch; now, with constantly increasing costs to face, the outlook is not encouraging. For example, Japan is making progress in the production of textiles, and is cutting into England's textile trade, which is causing a great deal of concern in the Lancashire district. The Japanese competition is said to be more serious than was the German, and the markets of India and the Far East are turning to Japan for textiles. In one case cited the Japanese selling price was cheaper than the English cost. The newspapers try to assure the British manufacturers that while their trade may be smaller in some places it is probably increasing in other districts; also that Japan possesses no more spinning mills than are to be found in any one of the larger Lancashire towns; and that from the products of these mills the home trade must be cared for ahead of the export trade. It is admitted that the Japanese product is growing better in quality, colors and variety.

Japan is becoming a serious competitor in the brush trade as well, and it is claimed that it is because of the British manufacturer's slowness to introduce production by automatic machinery.

Formerly the Lancashire textile machinery manufacturers exported to practically all the world, even to America, in spite of the 45 per cent duty on their machinery. Now American manufacturers are quoting within 2 or 3 per cent of the English prices in Italian, French, Belgian, and other markets. Prior to 1914 England exported $40,000,000 worth of this machinery annually. There is a great deal of textile machinery to be built for the British factories, and the shops are now being changed back from their war products.

South American Investments Maintained

England continues her investments in South America. Recently a British syndicate was formed with a capital of $10,000,000 for the purpose of developing some of the iron deposits in Brazil, and possibly shipping some of the ore to England. Brazil is considering a proposal to impose a condition that for every thousand tons of ore exported a specific quantity of steel should be manufactured (by the exporters) in Brazil. This should lead to development of the metal-working industry in Brazil.

Last year England sent a mission to Brazil to study trade relations with that country, the commission being headed by Sir Maurice De Bunsen. The visit is to be returned by a party from Brazil who are to be guests of the Federation of British Industries, an export association. At the end of the tour the federation will send a permanent commission to Brazil.

British manufacturers are giving serious thought to the regaining and expanding of their foreign markets. To this end several associations have been formed. Two of them, the British Manufacturers' Corporation and the Federation of British Industries, have combined in one body. The British Manufacturers' Corporation has a membership of 300 firms, and the Federation includes over 800 firms and 170 trade associations. It is proposed to appoint commissions of high commercial standing in foreign markets to act as advisers and to collect information regarding foreign trade.

The Anglo-Chinese Engineers Association has been formed by 42 non-competing firms of British engineers to work in China. Another company, which has as members some of the leading English manufacturers and shipbuilders, and known as Representation for British Manufacturers, Limited, is to operate in China and Eastern Siberia.

In addition a great many trades and industries are forming export associations to secure for their members data regarding the different export fields, and to actively take up sales work for their members only. Most of these associations are non-competing.

Continental Railroads Need Equipment

A great many locomotives and cars are needed to replace the large number sent to the Continent, and those worn out, and also to take care of normal growth. Those in service have not been kept in proper repair, and a great deal must be done along this line. The railways furnished a great many men to the army and navy, the London & Northwestern having had 34 per cent of its men in service. It is common practice for the larger railways to build their own locomotives, and several have well-equipped shops—the L. & N. W. at Crewe; the Midland at Derby; the Great Western at Swindon; the Caledonian at Glasgow, etc. There are some locomotive builders who furnish locomotives to the smaller lines, and in addition, both Vickers, Ltd., and Armstrong-Whitworth & Co., Ltd., will make them. It has been proposed to concentrate all locomotive building at one or two plants and also to pool all of them, as well as the cars, under Government control. Probably very little additional shop equipment will be required for the program to be undertaken, although some additions must be made.

Outright Government ownership has been proposed, but it does not meet with much favor on account of the present deficit. Now the returns on stock and bonds are guaranteed, but under the system of control to be instituted under the Ways and Communications bill, no guarantee will be included.

Should Carry Heavier Loads

I believe all the British railways must undergo a gradual change looking to heavier train loads and lower operating costs. This, of course, will necessitate larger cars, which in turn means that all tunnels must be widened and deepened. The roadbeds are splendid, and could undoubtedly stand heavier loads. Eventually all cars probably will be fitted with air brakes and automatic couplers.

England is beginning to think about all-steel passenger cars. The former price position of wood (for this work) and steel is reversed; iron and steel are 124 per cent higher than in 1914, while timber averages 218 per cent higher. It is estimated that timber imports are two years behind, and that five years will be required to meet the demand for timber for rolling stock.

Car Ferry Service Successful

In 1916 a special Channel port (Richborough) was developed for a car ferry service to France. The results astonished the country, and now it is proposed to establish a car ferry service to Sweden, in addition to extending the Channel service. The Swedish State Railway has submitted to its Government a report recommending this ferry, and suggesting six 13,000-ton train ferries, each carrying four lines of rail to accommodate 500 tons of freight. It is pointed out that in the past one of the advantages Germany had in doing business with Sweden was because of her low haulage costs. This trade has grown in proportion as transportation facilities were developed. The British railways concerned look upon the proposition favorably, for it would give improved communications with Finland and North Russia over a new line of railway, the route for which has been surveyed. Great Britain's trade with Sweden has been declining for the past few years, and this gives added interest to the proposal. This is one more way in which England is reaching out for world trade.

Automobile and Tractor Industries

British automobile manufacturers have never seriously tried to secure foreign business, as they felt the trade demanded a type of chassis which would not appeal to the home market. They now recognize that the home demand cannot take up the possible production from their present factories, as some have been increased many times their former size, and they are studying the export field.

Large numbers of tractors will be built, mostly by companies engaged in engineering and agricultural machinery manufacture. They are mostly buying various units which they are not equipped to make, although some companies are putting in equipment to balance up their shop for the new work. A tractor exhibition will be held in July.

Labor a Constant Problem

"The attitude of labor" has always been an ever-present subject in England. The unions are very

strong, and contain about 75 per cent of the labor element. In the past the position of employer and employee has been that of "master and man." The position is improving in that both are endeavoring to cooperate.

Wages are to-day far higher than in 1914, and this has, of course, been reflected by higher costs in every line. During the war the Government took control of many branches of industry, and effected wage increases, following which some industries were subsidized to keep down prices to the consumer. It is next to impossible to reduce wages, first because the cost of living has not come down sufficiently, and second, because of the power of the unions. These "societies," as they are called, are recognized by most employers, and union conditions prevail in the majority of shops. There were two outstanding points in labor's program which the war made possible of enforcement, namely, shorter hours and higher wages. The standard working week now varies from 44 to 48 hr., with weekly wages no less than when the working week was 55 hr.

Number of Women Workers Reduced

We already know of the extent to which woman labor was employed during the war on all kinds of work, even to scraping on machine tools. The question was raised in America as to whether they would be continued after the war, and if so, what effect this would have on costs and prices. This whole question has been and is being answered now, for while women are still working in some shops their number is greatly reduced. In some cases men refuse to work with them, and have struck. In other cases employers have reduced the force of women workers as rapidly as possible. The unions took up the whole question with the Ministry of Labor, and secured favorable decisions, all looking to the replacement of these "dilutees" by men, where such men were available. The general report from employers is that female labor was highly satisfactory on repetition work, such as screw machine work. The Armstrong-Whitworth shops, Newcastle, employed 12,000 women.

Want Pre-War Conditions Restored

During the war the Government induced the unions to set aside certain practices which restricted output, with the promise that former conditions should be restored, after peace was signed. A bill was introduced in Parliament to restore the practices abandoned during and in consequence of the war. This bill made such restoration compulsory under certain conditions. The unions claim the restoration of every workshop practice, while the employers claim that the pledge applies only to practices which restrict employment or production. There will probably be some "trading" between employer and employee, but it would not be surprising to see most of the old rules and practices reinstated at least until such time as the men learn that restricted output only means higher selling prices and higher living costs for them as well as for their employers.

A great many things formerly imported (particularly from Germany) are now being made in England, such as dyes, hosiery, etc. Steel for wire was formerly imported from Germany and Belgium, but now automatic drawing mills produce 1500 tons per week with the same staff formerly required for 35 tons per week. This is another indication of the awakening to the advantage of automatic machinery, although there are still a great many trades which have not realized the advantage of improved methods.

Aim at Lower Production Costs

Reconstruction did not get under way as rapidly as was anticipated nor as rapidly as the British manufacturers had hoped. This was due to several causes, probably the largest of which was the control exercised by the Government over raw materials, uncertainty regarding costs of labor and materials, and uncertainty regarding the excess profits tax. The first cause was removed May 1, when Government control was removed from metals, but with the removal of that control iron and steel prices advanced. The second cause has not yet been entirely removed, so prices of finished products must be set high enough to compensate for such increases as it may seem necessary to make. The third cause—excess profits tax—has been only partially removed, having been reduced from 80 to 40 per cent.

Evidence of a new era in British manufacturing is seen in the combinations now being formed in various lines, such as were formed in America a number of years ago. Thus, the United Steel Companies, Ltd., recently formed from five separate companies, own and operated coal mines, iron mines, blast furnaces and rolling mills. Some other combinations have been formed in iron and steel, though not so far-reaching as the above. Several of the big agricultural implement firms have bought control or amalgamated with firms in similar lines. A new electrical manufacturing company, styled the English Electric Co., Ltd., includes the Coventry Ordnance Works (whose principal product now will be small motors); Dick, Kerr & Co. (contractors for large electrical installations); Phoenix Dynamo Works (large motors and dynamos); United Electric Car Co. (electrical street cars), and Williams & Robbins (large direct connected engines and turbines). All these combinations are looking toward better manufacturing facilities and reduced costs.

Swedish Need of Machinery

WASHINGTON, Aug. 19.—The Bureau of Foreign and Domestic Commerce has made public an interesting report by Leo H. Strauss, secretary to the American trade commissioner at Stockholm, concerning the present demand for equipment for factories in Sweden. He reports that the present equipment in those plants is not in good condition, imports of machinery having been held up during the war.

In 1912 Germany furnished one-half of the Swedish machinery demands; England 20 per cent; America 15 per cent and Denmark 5 per cent.

"During the war," reports Mr. Strauss, "Swedish machine shops were active in their endeavor to duplicate imported machinery, and owing to the blockade Swedish manufacturers had to be content with the domestic product. As to the quality of the latter, it is apparent that it is not up to the standard of American goods. This is evidenced in the desire of Swedish manufacturers to purchase American machines, which have always found favor in this market.

"The following figures for 1912 will give a fair idea of the normal imports of some of the various classes of machinery. At present, however, the demand is larger than these figures indicate.

Swedish Imports of Machinery

	Crowns.
Lifting apparatus	299,614
Presses	367,895
Drilling machines	218,169
Milling machines	395,589
Lathes	766,320
Leather goods machinery	265,431
Textile machinery	1,008,692

"Another important item of factory equipment is machine tools. There is quite a demand for this class of tools, under which can be mentioned cutters, twist drills, threading tools, reamers, gear cutters, measuring tools (micrometers, gages, etc.) emery grinders, files, hack saws, welding and soldering apparatus, setting-up tools, wrenches and chucks, especially the electromagnet and compressed-air types, which offer a large field in Sweden. Bits, hand and machine vises, and the portable types of compressed-air tools are also among the articles in demand.

"An important fact to be borne in mind is that all measuring machinery and apparatus must be gaged in millimeters, to conform to the European standard of measurement.

"Belting, both balata and leather, trolleys, various lifting appliances, cranes, derricks and hardening furnaces are some of the other equipment needed.

"Sweden is looking forward to a period of unusual industrial activity. Factories are preparing to increase their output, and many new concerns are being established. American exporters will find an ample market for their products in Sweden provided they form necessary connections. The occasion calls for immediate action, and American firms should avail themselves of the opportunity."

NEW NOSE FORMING MACHINE

Steel Cylinder Revolved While the End Is Forced Against Three Forming Rolls

The forming of various shapes of noses on steel cylinders, tubes and tanks, suitable for the commercial transportation of explosive gases and liquids, has been rather an expensive process compared to the manufacture of the article proper, due to the many operations that have to be performed. To facilitate production and to form a more perfect nose, Walter Ferrier, general superintendent Elyria Iron & Steel Co., Elyria, Ohio, and Cleveland, has designed a machine for spinning the work while applied against three rolls, 120 deg. apart.

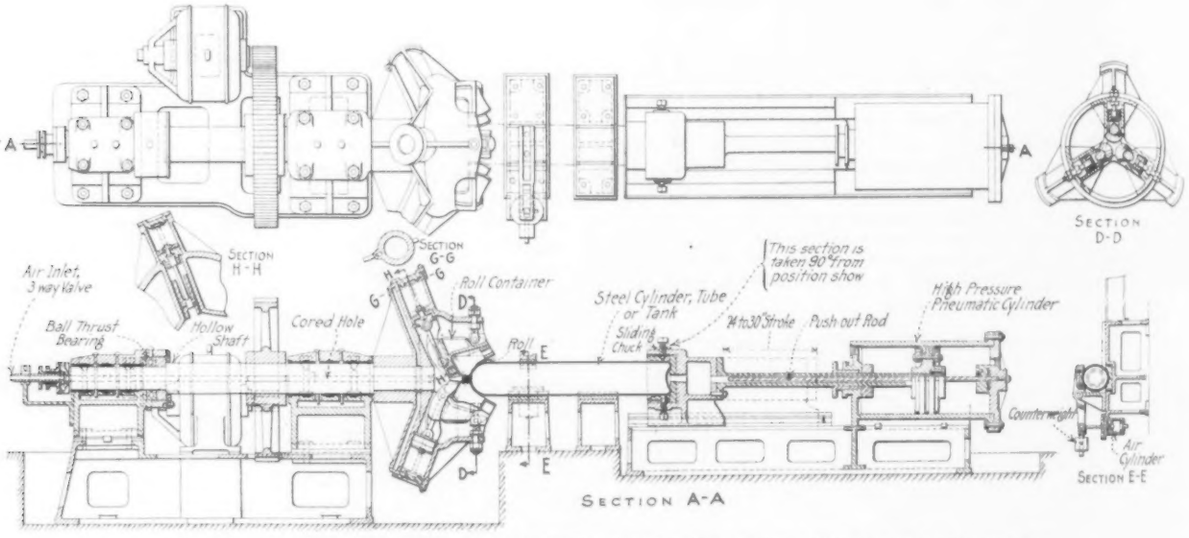
The rolls are operated on the surface of the partly formed nose so that by skin friction the top surface of the wall will not be elongated or pulled relative to the inside surface, but rather form the nose so that the tank will neither increase or decrease in length and thus make the area of any transverse cross section of the nose equal and the same as that of the tank or tube itself, thus putting sufficient metal at the neck to permit of drilling and tapping out. This is done by pivoting the roll containers on one end and operating the other end pneumatically by the direct expansion process.

The three air cylinders are cast in one piece with the housing equidistant 120 deg. apart, and at equal angles with center lines converging at the same point in the center. When the rolls are closed or in the position shown, they make an angle of 30 deg. with the horizontal and are always acting in planes radially equidistant apart. Their tendency is to always approach the horizontal or open up by virtue of the centrifugal force induced by the revolving housing. This force is counteracted by air pressure in the cylinders immediately upon application. This housing with its nest of rolls is revolved at about 130 r.p.m. by a hollow shaft driven by a 10-hp. motor through gears. A cored hole through the shaft admits the air by means of a stationary gland connection at the outer end to the three pneumatic cylinders operating the rolls. The air ports leading from the annular groove in the hub and the three radial holes emanating from the center core of the shaft are shown in sections AA and GG.

The tank is forced against the action of the rolls by a high-pressure pneumatic cylinder through the medium of a sliding chuck. This thrust is counteracted at the opposite end of the shaft by a ball thrust bearing. These shaft bearings are mounted on a common bed plate with the motor to reduce the vibration caused by the revolving housing to a minimum.

The jaws of the sliding chuck are adjustable by screws and interchangeable to suit the contour of the base and diameter of the tank or tube to be nosed. This chuck is directly connected to the piston in the high-pressure cylinder with a hollow steel rod which slides back and forth over a smaller stationary push-out rod. Regardless of the length of stroke of the main ram, the end of the push-out rod must extend at least 6 in. beyond the back end of the stroke so as to push the tank out of the jaws completely before the piston comes to the back end of its stroke or in the position ready for receiving. Means for adjusting the length of the stroke are provided.

After the tank is placed in line, but before nosing, it has to be clamped as shown by section EE to prevent the neck from being formed out of true alignment. The dot and dash lines show how these jaws can be interchanged to suit 6-in. or any size tank within the limits for which the machine is designed. This clamp is operated pneumatically also by an air cylinder. Immediately after the air pressure is released in the cylinder the clamp automatically opens up aided by a counterweight. The main cylinder, being double-acting, is controlled by a 4-way valve, and the air inlet through the main shaft to the roller cylinders is controlled by a 3-way air valve since they are only single-acting.



Machine for Spinning Noses on Receptacles by Means of Three Rolls at 120 deg. Centers

With this rolling machine, it is pointed out that one tank can be nosed in one heat, the time required being less than one minute, also one man can operate the whole controlling mechanism, one 4-way valve, two 3-way valves and one motor controller, which does not have to be operated for each tank, but only for starting and stopping the machine. When running at full capacity the machine requires an air supply of about 10 cu. ft. per min. at a pressure of 100 to 120 lb. per sq. in.

Machinery Exhibition in New York

The international machinery exposition operated by the Merchants and Manufacturers Exchange, 405 Lexington Avenue, New York, is scheduled to open in the Grand Central Palace, New York, Oct. 15. The company intends to have a separate exposition on each of the upper eight floors of the building. Among these will be one devoted to mining machinery and one to material handling machinery, milling machinery, lathes, drilling machines, screw cutting machines, etc. The mining machinery exposition will be in charge of Howard R. Ward, formerly consulting mining engineer with the American International Corporation and the material handling machinery exhibit will be managed by Lloyd L. Warfield. The Merchants and Manufacturers Exchange is controlled by the Nemours Trading Corporation, Alfred I. du Pont, president.

Investigation of Magnetic Steel Analysis*

Practical Results on Four Kinds of Steel —Separation of Good and Poor Material Possible—Quantitation Commercial Phase

BY N. J. GEBERT

SINCE the publication of Scientific Paper No. 272 of the U. S. Bureau of Standards, "The Correlation of the Magnetic and Mechanical Properties of Steel," a great deal of interest has been aroused in the magnetic test method. Possibilities of the practical application of this method have been shown in the paper "Some Applications of Magnetic Analysis to the Study of Steel Products," by C. W. Burrows, submitted at the 1917 meeting of the society. Both of these papers contain the statement that the evidence seems to point to the conclusion "that there is one and only one set of mechanical characteristics corresponding to a given set of magnetic characteristics and conversely there is one and only one set of magnetic characteristics corresponding to a given set of mechanical characteristics."

The writer has failed to find in the literature definite test results covering those points which would have an immediate and practical appeal to the metallurgist concerned in the many problems arising in the heat treatment of steel. The lack of such data has possibly been due to the fact that those who have carried out the pioneer work in magnetic analysis have been forced to devote considerable time to the development of magnetic testing apparatus, free of complications, but retaining sufficient accuracy in measurement. The method of making magnetic measurements adopted by this society as standards ("A 34-18; A. S. T. M. Standards, 1918) requires the preparation of two specimens, as near alike as may be, to permit the accurate testing of one, which means a considerable handicap in the routine testing work of the practical metallurgical engineer. However, the recent developments in permeater design now permit the testing of single specimens without sacrificing accuracy and have greatly simplified magnetic testing, both from the standpoint of ease and time involved.

The permeator used in this investigation was one of the Fahy Simplex type, slightly modified by the author to accommodate specimens of 4½ in. length. The accuracy of the magnetic test results to be obtained by this modified apparatus was determined by a check test carried out by the U. S. Bureau of Standards on a sample bar. Extremely close agreement between the results was obtained by the standard method and the simplex method.

Table 1.—Physical and Magnetic Tests of Nickel Steel

No.	Draw, deg. F.	Tensile strength, lb. per sq. in.	Elongation in 2 in., per cent	Reduction of area, per cent	Brinell hardness	Maximum induction, Bm.	Residual induction, Br.	Coercive force Hc.
1.	Anneal.	89,000	27.0	54.9	179	19,470	10,940	6.1
2.	0	273,500	10.5	34.1	512	17,400	10,190	22.5
3.	212	271,200	11.0	38.0	512	17,000	10,030	23.0
4.	380	260,000	11.7	43.0	480	17,500	10,640	23.3
5.	450	230,000	13.0	50.0	460	19,900	12,100	13.0
6.	600	201,000	14.0	56.8	418	20,050	12,140	12.0
7.	700	180,300	14.4	58.0	375	20,050	12,160	11.5
8.	800	160,500	15.0	60.0	321	20,050	15,600	11.0
9.	900	145,500	17.5	60.8	302	20,080	15,470	10.4
10.	1000	132,300	20.0	61.5	269	19,600	15,300	10.3
11.	1200	107,500	24.0	66.5	225	19,500	15,060	9.6
12.	1400	98,000	24.5	57.3	202	19,450	10,800	9.2

Specimens were quenched in oil from 1500 deg. Fahr. and drawn as stated.

Kinds of Steel Examined

Since a satisfactory method of testing finished or partially finished steel parts, which does not destroy the material, would be of value in the study or inspection of heat-treated products, an investigation of the magnetic analysis of several representative steels under various stages of treatment was undertaken. The steels examined are as follows:

Nickel steel.....0.38 per cent C.; 3.50 per cent Ni.
Chrome nickel steel..0.36 per cent C.; 3.50 per cent Ni.; 1.50 per cent Cr.
Straight carbon tool steel.....1.00 to 1.15 per cent C.
Swedish chrome file steel..1.19 per cent C.; 0.39 per cent Cr.

The magnetic tests were conducted on the finished standard tensile specimens held in detachable threaded bushings to insure proper contact with the pole faces. They were encircled by a coil 2 in. long and ¾ in. inside diameter, thus covering the 0.505 in. section throughout its length. Both tensile and Brinell tests were made in accoradnce with the standard practice.

Table 2.—Physical and Magnetic Tests of Chrome-Nickel Steel

No.	Draw, deg. F.	Tensile strength, lb. per sq. in.	Elongation in 2 in., per cent	Reduction of area, per cent	Brinell hardness	Maximum induction, Bm.	Residual induction, Br.	Coercive force Hc.
1.	Anneal.	96,000	22.0	41.8	180	18,760	11,470	6.4
2.	0	.....	...	...	...	16,440	10,280	25.3
3.	212	.....	...	...	...	16,300	10,010	25.5
4.	380	265,000	10.8	38.0	444	16,500	10,400	25.1
5.	450	250,000	10.8	41.0	410	19,540	12,180	14.8
6.	600	222,000	11.0	43.6	364	19,690	12,650	13.5
7.	700	212,000	12.0	45.0	351	19,600	12,900	13.3
8.	800	193,500	13.2	46.0	332	19,650	15,500	12.7
9.	850	178,000	15.5	47.5	311	19,640	15,480	12.3
10.	1200	126,000	22.5	59.0	228	19,270	15,230	11.0
11.	1300	118,000	23.5	55.4	217	18,840	13,100	10.5
12.	1400	111,500	23.5	50.9	207	18,040	11,140	10.0

Specimens were quenched in oil from 1500 deg. Fahr. and drawn as stated.

Specimens drawn at 0 and 212 deg. Fahr. broke in the threads and tests were discarded.

The magnetic data obtained and which are tabulated below include the maximum induction (Bm) under a magnetizing force of 150 units; the residual induction (Br), or that induction which persists in the specimen when the magnetizing force is reduced to zero; and the coercive force (Hc) or that reversed magnetizing force which is necessary to reduce the residual induction to zero. The product, Bm x Hc, is proportional to the hysteresis area and represents the energy absorbed by the material when it is successively magnetized and demagnetized. The above magnetic quantities are those more commonly employed in magnetic analysis.

All material was annealed prior to heat treatment. the specimens in each group were quenched in one heat, after being brought up slowly to temperature and held there 10 to 15 min. In drawing, the specimens were brought to heat slowly, held there 30 min. and cooled in the air. The furnace employed was of the wound electrical resistance type. Tables 2 and 3 show the tensile data, Brinell hardness and magnetic characteristics of the nickel and chrome-nickel steels.

The curves shown in Fig. 1 were plotted from the

*From a discussion presented at the Annual June Meeting at Atlantic City, N. J., of the American Society for Testing Materials. The author is metallurgist for Holz & Co., Inc., New York.

above data. They (dark and light solid lines) show the relation of the Brinell hardness to the hysteresis area (Bm x Hc) of the nickel and chrome-nickel steel, respectively, while the dark and heavy dotted lines illustrate the relation of tensile strength to the hysteresis area of the chrome-nickel and nickel steels, respectively.

Value of the Method

Considering the fact that the magnetic data, so closely allied to the strength as expressed in tensile and Brinell hardness units, have been obtained by measurement of reaction forces which leave the material entirely unchanged, the value of this method, both for routine and research work, is quite apparent. Referring to the values shown in Tables 2 and 3, it will be seen that between the drawing temperature of 380 and 450 deg. Fahr., there is a considerable increase in the in-

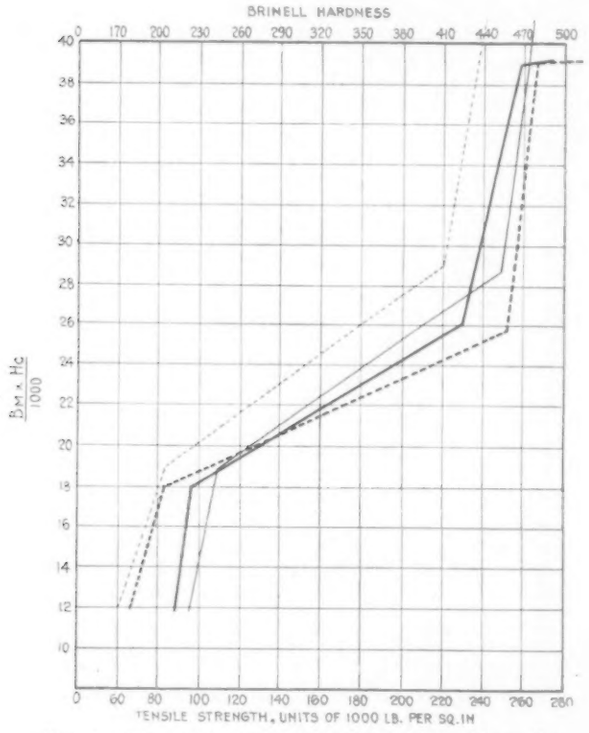


Fig. 1.—The Dark and Light Solid Lines Show the Relation of the Brinell Hardness to the Hysteresis Area (Bm x Hc) of the Nickel and Chrome-Nickel Steel Respectively, While the Dark and Heavy Dotted Lines Illustrate the Relation of Tensile Strength to the Hysteresis Area of the Chrome-Nickel and Nickel Steels Respectively

duction and residual induction and a corresponding decrease in the coercive force. It has been fully established that the cementite (Fe_3C) in a quenched steel largely exists in a state of solid solution. The point at which this cementite comes out of solid solution has been determined microscopically by many metallurgists and was magnetometrically measured by K. Honda ("Magnetic Investigation of the States of Cementite in An-

Table 4.—Magnetic Values of Swedish File Steel—Size of Section, ½ In. Square

Water treatment, Deg. Fahr.	Maximum induction, Bm.	Residual induction, Br.	Coercive force, Hc.
1350	15,190	9,940	14.0
1400	12,890	8,880	47.5
1430	12,620	8,430	47.8
1450	12,240	8,230	48.7
1480	11,910	7,760	50.4
1500	11,390	7,440	50.4
1530	11,240	7,150	50.0
1550	11,070	6,980	48.4
1600	9,690	5,540	44.3
1630	Cracked badly		

nealed and Quenched Steels," Science Reports of the Tohoku University, Vol. VI, No. 3).

On examining Tables 2 and 3 we see that the intensity of magnetization of the quenched steels is very low. This is due to the fact that cementite is less magnetizable than ferrite and when dissolved in ferrite the intensity of magnetization is decreased according to Tammann's Law (*Zeitschre für Phys. Chem.* 65 [1908]. 79). On heating a piece of steel, in which the cementite is held in solid solution, above the Ac_3 point the cementite comes out of solid solution and the intensity of magnetization is increased to a great extent as shown in the specimens drawn at 450 deg. Fahr. The tensile strength and Brinell hardness show little change in this range while the magnetic properties show a considerable increase in magnetism and a corresponding decrease in coercive force.

In this region the magnetic values will be a better indication of the magnitude of the structural changes than either tensile or Brinell tests. By thus giving us such valuable information without injuring the specimen, magnetic analysis permit tests which enable us to clear up many difficulties in hardening practice.

Separating Unsatisfactory Products

The writer quite frequently met the following problem in the heat treating of taper parts for roller bearings. Such taper parts, after quenching, are usually drawn at 375 deg. Fahr., or, in many cases, given a quick draw at 400 deg. Fahr. This quick draw consists

Table 3.—Magnetic Values of Straight Carbon Tool Steel—Size of Section ½ In. Square

Water treatment, Deg. Fahr.	Maximum induction, Bm.	Residual induction, Br.	Coercive force, Hc.
1340	15,400	9,360	18.8
1360	13,980	8,860	32.0
1380	13,370	8,470	37.5
1400	12,450	7,980	45.0
1420	12,050	7,720	46.0
1440	11,640	7,600	47.8
1460	11,440	7,400	49.0
1480	11,040	6,720	50.0
1500	10,340	5,980	50.0
1520	9,940	5,740	50.0
1540	9,640	5,560	49.8
1560	9,340	5,320	49.2
1580	8,860	4,800	48.0
1600	8,190	4,330	45.3
1630	Cracked badly		

of bringing the material up to heat slowly (in about ½ hr.) and immediately removing from the bath upon reaching 400 deg. Fahr. In using this latter method, it frequently occurs that one batch passes the customary file test, while the next lot is dead soft to the file and is rejected. The only method used at present for separating the soft from the hard is by the "feel" of the file. Magnetic testing offers convenient and rapid means for separating unsatisfactory products from those successfully treated and would eliminate what is now to a considerable extent guesswork.

The increase in residual induction between the drawing temperatures of 700 and 800 deg. Fahr. can be explained through the transformation of the double carbide of iron taking place at about 750 deg. Fahr., as

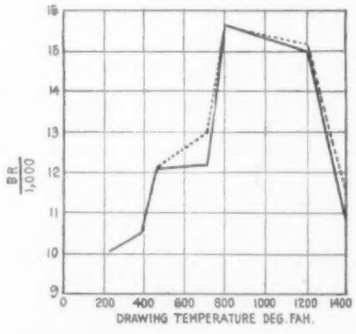


Fig. 2.—The Dark Line Shows the Relation Between Drawing Temperature and Residual Induction for the Nickel Steel, While the Dotted Line Shows the Same in the Case of the Chrome-Nickel Steel

has been shown in the magnetic investigation by T. Ishiwara ("On the Magnetic Analysis of Carbides Found in Different Kinds of Steel," Sc. Repts. of the Tohoku Imp. Univ. Vol. VI, No. 5). Ishiwara measured the magnetization of the steel while heating and cooling and obtained a variation in the magnetization just below and above this transition point.

While the tensile strength and Brinell hardness are in relation to the hysteresis area of a given steel, the residual induction shows in a very marked manner the structural changes which take place during heat treatment. For instance, in heating slightly above this transition point (750 deg. Fahr.), the tensile strength does not show any marked drop while the residual induction changes considerably (increases), indicating that the structure of the material has undergone transformations. Plotting the residual induction against drawing temperatures on both the nickel and chrome-nickel steels, the curves in Fig. 2 are obtained. The dark line shows the relation between drawing temperature and residual induction for the nickel steel while the dotted line shows the same in the case of chrome-nickel steel.

Carbon Tool and Swedish File Steel

Magnetic data were also obtained on straight carbon tool steel and Swedish file steel when the materials were quenched in water from various temperatures and not subjected to a drawing temperature. Both these grades of steel are used extensively in practice and since their great hardness does not permit of satisfactory Brinell hardness testing, it was very important to determine whether the magnetic characteristics afford a suitable index as to whether or not a proper quenching temperature was used. The values for induction and residual induction, shown in Tables 3 and 4, vary directly with the quenching temperatures and enable us to determine from what temperature the steel has been quenched. The variations of magnetic values are of such magnitude as to permit the detection of the slightest difference in quenching temperatures.

Table 5.—Magnetic Value of Swedish File Steel Under Certain Heat Treatment

Treatment	Maximum induction	Residual induction	Coercive force
As received	15,540	11,530	13.3
1650 deg. Fahr., cool in the air, annealed at 1380 deg Fahr....	15,350	10,440	15.5
1650 deg. Fahr., cool in furnace, annealed at 1380 deg. Fahr.; water	15,110	9,720	14.0
1650 deg. Fahr., cool in the air, quenched 1450 deg. Fahr.; water	11,770	8,880	52.3
1650 deg. Fahr., cool in furnace, quenched 1450 deg. Fahr.; water	11,670	7,760	51.3

In order to ascertain whether a previous incorrect treatment could be covered up by a high quench or an anneal, the following tests were made. Material of the same chemical analysis used in Table 4 was investigated. The analysis of this Swedish file steel closely approximated that of steel used, for example, in balls and races. In the manufacture of these steels it is very important that the material does not cool slowly from above the Acm point (about 1650 deg. Fahr.) as this brings about the rejection of the cementite to the grain boundaries. This frequently occurs in bars cooling from the forging or rolling temperatures, possibly lying on hot ashes or dirt, or being rolled or forged at an extremely high temperature. Material in this condition upon subsequent hardening would be extremely brittle and unfit for many uses.

In Table 5 the magnetic characteristics of this material in the conditions as received and when cooled in air and cooled in the furnace respectively from a high temperature, then annealed and hardened, are shown.

As can be seen from the above data, neither an anneal at 1380 deg. Fahr. nor a quench in water from 1450 deg. Fahr. could cover up magnetically the previous incorrect cooling. The magnetic values still show the material to be structurally different, especially as regards residual induction. The data published form a report of an initial investigation which shows very promising results and certainly warrants considerable additional work along these lines.

Practical Phase of Magnetic Analysis

In magnetic analysis we have a method of test which is unique in that it is capable of giving results of value under procedure which has no permanent influence on the material examined. No other known successful testing method possesses this important advantage. Magnetic analysis enables us to draw distinctions between steels where the present methods of test fail to make sufficient differentiation. The possibilities of magnetic analysis in the examination, study and duplication of products which have given exceptional performance in actual service are apparent.

Magnetic analysis of iron and steel should be of the same value to the metallurgist as chemical analysis is to the chemist. Microscopic investigation of steel gives results which are qualitative, rarely quantitative. The preparation of micro-sections often releases stresses in the metal to be studied and, in general, tests of this kind require a great deal of individual judgment and experience. The magnetic tests are expressed in definite figures, permitting quantitative measurements, and the interpretation of test data leave no room for conjecture.

To Study Phosphorus and Sulphur Limits

WASHINGTON, Aug. 19.—Representatives of the Railroad Administration and of the Bureau of Standards will meet in September with a committee of the American Society for Testing Materials to work out a program of definitions for permissible contents of sulphur and phosphorus in railroad steel. At the same time it is expected that this work will be broadened to cover the whole field of steel products.

The conference will be held at the Bureau of Standards here. It will be of exceeding importance to the iron and steel industry because it will attempt to work out by elaborate experiments the long debated question of the amount of phosphorus and sulphur that safely may be left in steel. During the war the American Society for Testing Materials changed its standard specifications so as to increase by 0.01 per cent the permissible content of sulphur and of phosphorus in steel. This was made necessary by the increased war demands and by the difficulties of the scrap and fuel situation. This change covered 43 items. Since that time the A. S. T. M. has restored the test standards for 29 items, and deferred action until next year on the other 14. As the contents of sulphur and phosphorus are of the highest importance in determining the brittleness of steel, the Railroad Administration has been particularly interested in securing a definite specification which would permit the highest amount of these ingredients and at the same time respect the safety needs of the lines. This is the occasion for the participation of the Railroad Administration in the coming conference.

The situation also has an important aspect in its relation to the large stores of surplus scrap on hand in the War Department. Much of the scrap that came from war-time operations has a higher content of sulphur and phosphorus than present specifications would permit. If it is found possible to work up this steel without reducing its sulphur and phosphorus content, it would prove a decided economy. The experimental work will be done chiefly by the Bureau of Standards and will cover a wide range of laboratory and furnace tests. The resulting specifications, it is expected, will be the most definite promulgations ever attempted on this important item.

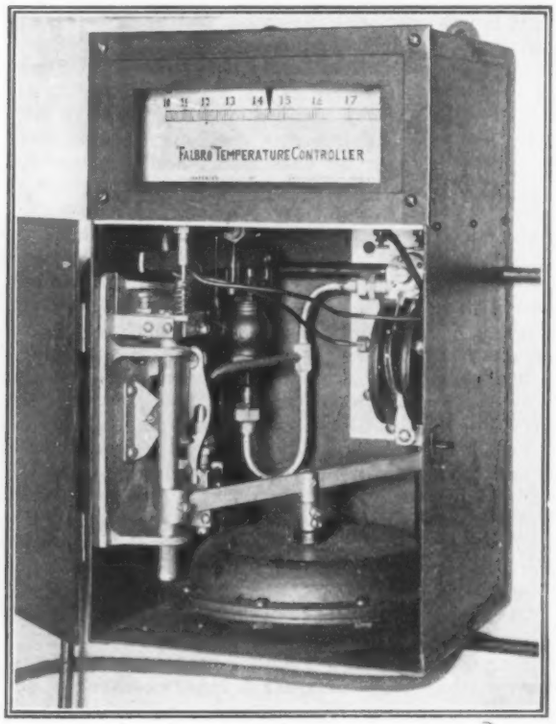
The M. J. Walsh Machinery Co., 141 Sycamore Street, Milwaukee, jobber and dealer in new and used machine tools and other metal-working equipment and supplies, has increased its capital stock from $50,000 to $100,000 to accommodate the growth of its business and to provide for further expansion. The officers are: President, M. J. Walsh; secretary, William C. Kalt; treasurer, Edwin K. Rundle.

Combination Automatic Sprinkler and Hot Water Heating System

An installation utilizing the automatic sprinkler system for hot water heating was described at a recent meeting of the American Society of Heating and Ventilating Engineers, Pittsburgh, by A. W. Moulder, Warren, Ohio. The system employs insulating arms for the sprinkler heads. The expansion and contraction of the water are taken care of by a ¾-in. pipe line at the source of supply, installed as a by-pass around the alarm or check valve, and by water relief valves. A complete system of return lines is run, connecting to all lines, with automatic air trap on the return lines to provide for the elimination of air. The system is explained as being more economically adaptable to buildings of such design that the ceiling surface is large in proportion to the total heat loss, which means that the radiating surface contained in the sprinkler piping will be large in proportion to the total radiating surface required. It was found that the sprinkler system is free from air, thereby causing an earlier alarm and immediate delivery of water, and that if there was a stoppage in any part of the sprinkler system it became apparent in the immediate stopping of circulation, thereby affording a means of inspection on the sprinkler system.

Gas Furnace Temperature Controller

A device for controlling temperatures in gas furnaces, ovens, lead pots and other places using gas fuel, has been placed upon the market by the Wilbride



Gas Furnace Fuel Feed is Regulated by This Temperature Controller by Means of Air-Operated Valves Actuated by an Air Motor at Intervals of 4 Sec.

Co., Norwood, Pa. It is operated by air pressure and consists essentially of the controlling instrument and an automatically operated valve for gas.

The controlling mechanism is made up essentially of a galvanometer and an air motor with clamping mechanism for holding a plate on the galvanometer pointer at intervals of 4 sec., when the air is forced through an opening in the plate, thereby causing the valve to operate the gas and air valves to regulate combustion. The position of the air and gas valves is determined by the position of the galvanometer pointer. The needle of the galvanometer, when reaching a point higher or lower than the temperature that has been set, releases the air which operates the valves either to reduce or increase the supply of fuel.

In order that the instrument may be set in any desired temperature within the range of the scale, an index pointer is provided. A thermo-couple placed in the furnace to be controlled is connected with the galvanometer. By this method temperatures up to 3000 deg. Fahr. can be controlled; but for higher temperatures the radiation system is necessary. It is stated that the control does not vary more than 1 per cent of the range scale.

A multiple control can also be furnished, it is stated, so that the temperature of several points, for example in a furnace having more than one burner, may be automatically regulated.

Registering Trade Marks Abroad

The importance of registering trade marks in foreign countries is emphasized in "Facts" published by William E. Richards, counselor at law, 277 Broadway, New York. The article points out that the piracy of trade marks is carried on to a far greater extent than is generally supposed. Hardly an issue of the official trade marke journals of Cuba and the South American countries appears without disclosing notice of applications for the registration of some and often many of the best known and more valuable American trade marks in the names of foreigners.

Before the war the Germans were the greatest offenders next to the South Americans themselves. A number of concerns have been making a business of registering unprotected trade marks, known to be valuable, in South American and other countries, and then either flooding those markets with inferior goods, bearing these marks, or waiting until the rightful owner attempted to introduce his goods, and then demanding, and generally obtaining, large sums of money for the privilege of using the marks. This practice is not only possible, but is legal in many foreign countries, the laws of which regard the first applicant for the registration of a mark to be the legal owner of the same, without regard to prior use.

Until the laws of foreign countries are changed so that prior use is an essential to ownership and registration, the only remedy is for the American manufacturer and trader to register his trade marks in every foreign country to which his goods are shipped, or in which he has reasonable expectations of doing business, and see that his rights are thoroughly and completely protected.

Magnetic Sclerometer

Automatic & Electric Furnaces, Ltd., London, has a magnetic sclerometer for measuring the hardness of ferrous metals magnetically. The method is also suggested for determining the refining temperature of mild steel, the hardening temperatures of carbon and alloy steels and the requirements for correct normalizing and annealing. The method consists of subjecting a suitable rod, say 3 in. long by ½ in. diameter, to the heat it is desired to investigate. It is then placed inside a standard magnetizing coil and direct current flashed on it. Magnetized to saturation, it is removed and placed in a small search coil connected to a Grassot flux meter. The reading obtained on the flux meter represents the magnetic hardness. The flux meter and the search coil used give readings in terms of Maxwell-turns and C. G. S. units of coercive force so that the results are in absolute international units.

Examinations are open for Sept. 23 by the Civil Service Commission, Washington, D. C., for the position of associate mechanical engineer, $2,000 to $2,800 a year. Requirements are high school education or equivalent and at least 7 years' experience in safety or casualty inspection work. Applicants must be capable of holding conferences and addressing audiences. They may qualify in any of the following subjects: Elevators, power plants, steel mills, textile or paper manufacture. Candidates apply for form 2118, stating title of examination desired.

American Progress in Spanish Industry

Great Britain Concerned Over the Position Held by American Machinery, Particularly in the Mining Fields

THE British authorities are worrying over the progress which American steel industries are making in Spain. Copies have reached the United States of an interesting document prepared by the British Department of Overseas Trade concerning conditions and prospects of the iron and steel industries and engineering projects in Spain. It was prepared by William Thomson Anderson, expert commissioner sent to Spain for that purpose by the department.

The report deals at great length with the activities of Americans in Spain seeking trade and cites numerous instances where the British have lost trade. It also calls attention to the fact that American trade papers have gained wide acceptance in Spain and are proving of immense value in establishing American goods in the minds of Spaniards. The report refers specifically to THE IRON AGE, declaring that it is found everywhere among iron miners and the manufacturers of iron and steel goods, building materials and hardware. It also refers to the *Engineering and Mining Journal* of New York as being universally taken by managers and owners of Spanish mines. As a result, the demand for American mining machinery and equipment is great. Mr. Anderson recommends a similar propaganda for British goods. It is Mr. Anderson's opinion that there is a good opportunity in Spain to secure orders for British loading gantries, bridges and steel factory buildings. Mr. Anderson also comments on the expansion of coal mining in Spain and he considers that it has reached a point where it has brought about an important demand for coal mining and washing equipment. He gives tables as follows:

Air compressors and drills—Chiefly from American firms.
Coal washing and screening—Not many; mostly from Germany.
Machine tools—British, German and American, in order named.
Rolling stock—German and Belgian.
Locomotives—Not British.
Wire ropes—British; some German, of very poor quality.

In the Asturias, which is the center of the most active development and production of coal in Spain at the present time, Mr. Anderson believes that there is in prospect an immediate demand for boilers, briquetting machinery, washing and screening plants, lubricating oils, iron and steel pipe, iron and steel bars, nails, etc., hoisting engines, air compressors, cranes for loading ships, steam, compressed air, and electric haulage engines, explosives, shop tools, hardware, light railway equipment, locomotives, miners' tools, pulleys, all kinds of rolling stock, ropes, safety lamps, ventilating fans and auto-weighing machines.

Machinery is needed for the preparation of esparto. One large plant has been erected at Cieza, Alicante, for making esparto yarn. He insists that the present is the psychologic moment for developing this industry, owing to the great demand for sacking and rope yarns.

Iron Ore in Spain

Concerning iron, Mr. Anderson gives an optimistic report based upon figures collated by Julio de Lazurtegue in 1918. The accompanying table shows in condensed form the estimated quantity of iron ore unmined and the state of development and operation.

The Germans had been taking ores that were relatively high in phosphorous. The English, on the other hand, demand ores very low in both phosphorous and sulphur. They, however, tolerate considerable amounts of silica, and are content with comparatively low per cents of iron in the ore.

Mr. Anderson maintains that Spain is destined to reach an annual output of 1,500,000 tons of pig iron. Before the war it was approximately 450,000 tons, and during the war it increased to nearly 700,000 tons. Of this amount 60 per cent was produced by the great Spanish concern called the Altos Hornos de Vizcaya at Bilboa. Other large contributors to the total were the Fabrica de San Francisco al of Bilboa; Fabrica de Nueva Montana of Nueva Montana, Santander; and the Fabrica de Mieres of Mieres, Asturias. The iron and steel business in Spain is fairly well organized into the steel syndicate known as the Central Siderurgica, comprising the following concerns: Altos Hornos, Duro Felguera, Fabrica de Mieres, Fab. de San Francisco, Fab. de Moreda y Gijon, Fab. de Bidasoa, Hijos e Romualdo Garcia, Santa Ana de Bolueta, Sociedad Material para Ferrocarriles and the Union Carrajera.

Vogue for American Mining Machinery

Referring to mining machinery, Mr. Anderson directs especial attention to the aggressive and successful work accomplished in Spain by the Ingersoll-Rand Co. of New York, which he thinks gained a strong lead in Spain for air compressors and rock drills of all kinds. The Sullivan Machinery Co., New York and Chicago, also has done business in Spain. It appears that the Americans have practically absorbed the compressor business in this country, to the exclusion of others. Also, America takes the lead, according to Mr. Anderson, in steam shovels. The Rio Tinto mines in Huelva have 17 Bucyrus shovels at work, these ranging from 65 to 100 tons, loading up to 2500 tons per 10 hours.

Crushing machinery for the mines, however, is mainly British and German. Copper convertors are almost exclusively supplied by the Power and Mining Machinery Co., which company also furnishes other mining machinery in Spain. Ore cars are supplied to the Spanish mines mainly by the German firm of A. Koppel & Co.

Mr. Anderson puts the Spanish imports of iron and steel manufactures at 55,000 tons a year.

Spanish Iron Ore Reserves

	Tons.
Viscaya—All mines fully exploited	60,000,000
Guipuzcoa and Navarra—Partly exploited	10,000,000
Santander—Exploitation almost complete	30,000,000
Oviedo—Exploitation insignificant	60,000,000
Lugo—Exploitation partial	65,000,000
Extermadura, Segovia, etc.—Not yet exploited	10,000,000
Leon—Wagner, Ferradillo, Monte Teleno, etc.—Not yet worked	300,000,000
Huelva—Exclusive of sulphur ores unimportant	20,000,000
Sevilla—Exploitation unimportant	33,000,000
Malaga—Exploitation partial	30,000,000
Almeria—Exploitation important	30,000,000
Murcia—Exploitation limited	15,000,000
Teruel—Exploitation large	150,000,000
Ciudad Real—No exploitation as yet	10,000,000
Catalonian provinces—No exploitation as yet	15,000,000
Aragon—Exploitation partial	40,000,000
Logrono—Exploitation none	20,000,000
Total tonnage	900,000,000

The Mutual Truck Co. recently opened its factory in Sullivan, Ind. The enterprise is being backed by the town, which turned out in a parade headed by the first truck made. This had been tested out for thirteen months under adverse conditions. At the plant more than 1500 persons were seated and speeches were delivered by prominent men of the town, including the president and founder of the company, Robert E. Petrie.

STEEL PLANT LABOR

Strike Sentiment Chiefly in Common Labor Circles—Attitude of Skilled Workers

A conference of the national committee which is organizing workers in the steel plants will be held in Youngstown, Ohio, on Wednesday, Aug. 20, and union officials say that the result of the strike vote being taken among steel workers will be announced. The Pittsburgh district organizing officials report that substantial progress is being made, but officials of some of the steel companies, who are watching the situation closely, declare that comparatively few of the skilled steel plant workers have been induced to join the unions. Much of the progress in union organizing apparently is among common labor. Alien workers are reported to have been most receptive to the idea of joining labor unions.

Proposed Demands of Steel Workers

Reference has been made in THE IRON AGE to the fact that one of the demands of those who are now attempting to organize the steel workers of the country is that the companies shall collect union dues. The full list of demands is contained in the following announcement made from organizing committee headquarters, Magee Building, Pittsburgh:

IMPORTANT—ATTENTION

The following propositions, adopted by the National Committee for organizing Iron and Steel Workers, at the meeting in Pittsburgh, July 20, 1919, will be presented to the big steel corporations as soon as conferences can be arranged between them and the unions. These propositions are general in character and are subject to development when the various organizations prepare their respective trade demands.

1. Right of collective bargaining.
2. Reinstatement of all men discharged for union activities, with pay for time lost.
3. The 8-hr. day.
4. One day's rest in seven.
5. Abolition of 24-hr. shifts.
6. Increases in wages sufficient to guarantee American standards of living.
7. Standard scales of wages for all crafts and classifications of workers.
8. Double rates of pay for all overtime work and for work on Sundays and holidays.
9. Check-off system of collecting union dues and assessments.
10. Principles of seniority to apply in maintaining, reducing and increasing working forces.
11. Abolition of company unions.
12. Abolition of physical examination of applicants for employment.

When in force, these reforms will make the steel industry one of the best in the country to work in. To achieve them will require the co-operation of every iron and steel worker. Be a man and do your part. Join the American Federation of Labor at once and get all your fellow workers to do likewise.

It is clearly recognized, however, by the steel companies that strikes of unskilled laborers would seriously cripple steel plant operations and might, if a sufficient number were induced to quit work, cause a shutting down of many steel plants.

Although the proposals of the union organizers have not been formally presented to the United States Steel Corporation, or other steel companies, this will be done some time within the next few weeks. Steel company officials are rather loath to discuss what their attitude may be toward the demands which will be presented, but there are some who are willing to say that a widespread shutdown in the steel industry would be a national calamity and will undoubtedly be avoided, if it is possible to do so. If it came to a question of wage demands alone, it seems probable that the steel companies, according to all present indications, might meet the union officials in a conciliatory spirit.

Union organizers seem to be emphasizing the rates paid for common labor as most unfair from their point of view, it being contended that 40 to 42c. an hour, the average in the Pittsburgh district, is not sufficient to maintain a man and his family with living costs mounting so rapidly. Skilled steel workers apparently do not find serious objection to present rates of pay and working conditions, as is evidenced by the resolution recently adopted at a mass meeting of steel workers in the Vandergrift and Leechburg plants of the American Sheet & Tin Plate Co. This resolution stated "That we, the steel workers of Vandergrift and Leechburg works, here assembled, do voice our sentiments and say that we will continue at work under present conditions for the benefit of ourselves, our families and the future peace and prosperity of Vandergrift and Leechburg. Also that we resent any interference by any union, outsiders, or paid agitators to change the happy conditions which have existed in this community for twenty-three years," and was adopted unanimously.

William Z. Foster, secretary-treasurer of the national committee for organizing iron and steel workers of the American Federation of Labor, with offices in Magee Building, Pittsburgh, says that the proposals which are to be presented to the steel companies do not in his opinion necessarily mean a strike. He adds that the American Federation of Labor would prefer a peaceful adjustment of its demands, and that strikes will be called only as a last resort.

Some steel company officials go so far as to say that it is unthinkable that strikes of long duration will occur. One official says: "As a matter of public policy, the steel companies, in the present condition of national unrest, could not afford to permit serious and widespread labor disturbances in the steel industry."

American Chain Co. Employee Insurance Plan

The American Chain Co., Braddock, Pa., has worked out and will adopt a comprehensive plan of insurance benefits for its employees. Besides the usual health and accident features, it is planned to pay a cash benefit of $25 for a birth in the family of an employee, together with attendance of doctor and nurses. Death benefits will be given, ranging from $1,000 to $5,000, according to length of service and number of dependents. The company will also guarantee an annual vacation with pay to each employee with sufficient length of service to his credit and will establish a vacation bureau to assist employees in spending their vacations profitably and pleasantly.

Old age pensions will also be provided, and a rather unique feature is the furnishing of free legal advice to employees. The company will form an association and employees will be asked to pay an initiation fee of $1 and dues will be 50c. a month. The entire difference between this income and the expenses of the society is to be met by the company. Insurance society affairs will be governed entirely by the members and they are to judge the merits of every case coming up for action. Every member of the society who has been ten years or more in the service of the company creates for himself an insurance policy, which the company underwrites against permanent disability. For persons who have been in the employ of the company 20 years or more and have reached, in the case of a man, the age of 65, or in the case of a woman, the age of 55, a reserve force is created and such employees will be paid for services whether services are required or not. They may be called upon for light duties.

F. J. Hardison, of the International Union of Blacksmiths, Drop Forgers and Helpers, in addressing a meeting of steel workers at McKeesport, Pa., last week, stated that 95 per cent of the steel workers in the McKeesport district are now organized. He also declared that Butler, Charleroi, Monessen and Vandergrift are almost 100 per cent organized.

Labor Notes

Foundry laborers at 14 foundries in Belleville, Ill., went on strike Aug. 15, following a refusal of their demands for an increase of 15 cents an hour. They have been receiving 45 cents an hour.

The Allis-Chalmers Mfg. Co., Milwaukee, announced Aug. 15 that the 10 per cent bonus system which has been in effect at its main works at West Allis, since Jan. 1, 1917, is abolished effective that date, but that in its place all wages and salaries are increased 10 per cent beginning Aug. 16. The increase affects approximately 7000 employees.

The American Steel Foundries of Granite City, Ill., reopened last week after being shut down for more than two months, using one furnace and employing 600 men. The normal force of the foundry is 3800 men.

Pattern-makers, molders and core-makers at Waynesboro, Pa., have joined the local machinists with a demand for an 8-hr. day, effective Sept. 1, with time and one-half for overtime and double time for Sunday work; elimination of piecework is also asked. The pattern-makers ask a minimum wage of 86 cents an hour, and the molders and core-makers, 80 cents, minimum.

Employees at the plant of the Waterbury Co., 132 Taaffe Place, Brooklyn, manufacturer of wire rope, are out on strike. A number of employees at the works of the American Machine & Foundry Co., Second Avenue and Fifty-sixth Street, in the same city, are also out.

The one week long strike of employees of the C. Hager & Sons Hinge Mfg. Co., St. Louis, has been settled by giving 5 per cent increase in wages and taking back employees without discrimination . The strikers, demanded 20 per cent increase and recognition of their union.

Demanding a closed shop, a 48-hr. week and a minimum wage scale of 50 cents an hour, employees of the Standard Stamping Co., St. Louis, struck Aug. 15. Officials of the company claim they do not know what the men want and do not believe the men do themselves.

Order has been restored at Peoria, Ill., after State militia were sent to quell a riot that started when several hundred striking employees of the Keystone Wire & Steel Co. fired on guards protecting the company's plant. Three persons were shot and severely wounded and scores were hurt. The outbreak started eight weeks ago when employees struck for higher wages and a closed shop. Wage increases were granted but the company refused to recognize the union and for a time the plant was closed. The rioting had its inception when a truck-load of strike-breakers were brought to the plant.

A strike of 163 technical workers employed in engineering departments by the city of St. Louis has been threatened unless an increase of 15 per cent in their salaries is granted. The men are civil engineers, draftsmen and rodmen, who plan city construction work. The threat to strike is the first ever made by professional men employed by the city.

Federal Judge Dyer in the United States District Court in St. Louis last week issued an order restraining members of the Amalgamated Sheet Metal Workers International Alliance, Local Union No. 386, and the Painters Local No. 980 from "in any way impeding, hindering, obstructing or interfering with the business of the Blue Bird Mfg. Co., makers of washing machines." The members of the two unions are enjoined from entering upon the premises of the company against its wishes and from compelling or inducing by threats of violence any person to leave the employ of the company. Congregation of union men near the factory also is forbidden in the order. The two union organizations will appear in court Aug. 19 to show cause why the temporary order should not stand.

Forty-nine puddlers from Lebanon, Pa., have gone to work at the Girard, Ohio, puddle mills of the A. M. Byers Co., Pittsburgh, where there has been a scarcity of skilled workers. A number of furnaces at the two large puddle mills in Girard have been idle for several weeks because of the shortage of puddlers.

Employees of the Ohio Steel Products Co., Mineral Ridge, Trumbull County, Ohio, went on strike Aug. 13 to enforce their demand for an 8-hr. day with time and a half for overtime and Sundays. Organization of a labor union among the employees was partially effected by American Federation of Labor representatives.

Collective buying by employees of the Youngstown Sheet & Tube Co., Youngstown, was started Aug. 15 when the first orders were taken. The plan is being handled through the recently adopted representation system. The corporation is encouraging the movement and is lending all assistance possible through the welfare department. Workers have selected a representative to visit jobbers and wholesalers and purchase foodstuffs and necessities as advantageously as possible.

G. M. Duncan, formerly a major in the United States army, has been named labor engineer by the Youngstown Sheet & Tube Co., Youngstown, and has placed large numbers of returned soldiers. Major Duncan saw service with the Third Division at Chateau Thierry, San Mihiel and the Argonne, where he was wounded. Later he was with the army of occupation in Germany.

Canvass reveals that in excess of 40,000 workers are employed in the steel industry in the Mahoning Valley at present. Youngstown Sheet & Tube Co. leads with 13,000; Republic Iron & Steel, 7500; Carnegie Steel, 7500; Brier Hill Steel, 5500; Trumbull Steel Co., 5000; Sharon Steel Hoop Co., Mahoning Valley works, 1200.

Initial issue of the Youngstown Sheet & Tube "Bulletin," to "promote acquaintance among the employees," reached subscribers Aug. 14. R. J. Kaylor, publicity director, is editor. Besides departmental items it contains statements from President James A. Campbell, Vice-President and General Manager C. S. Robinson and General Superintendent W. C. Reilly. It is published by the Youngstown Sheet & Tube Co.

A general strike was declared Aug. 12 at the plants of the Andrews Steel Co. and the Newport Rolling Mill Co., Newport, Ky. The only question at issue concerned the refusal of the companies to recognize a new union formed in the galvanizing and corrugating departments. The two mills have been operated with union labor in the rolling mill departments ever since they were built about 35 years ago. There are now no indications of an early settlement of the present trouble and both plants are closed down.

Department of Labor and the Steel Workers' Demands

WASHINGTON, Aug. 20.—Government officials are trying to conceal their worries over the labor situation. The increase in the number of strikes and threats of strikes from all parts of the country has swamped the conciliation division of the Department of Labor. Even at that, the division has had nothing to do with the greatest of the strikes. It did not touch the railroad conflict, nor has it taken any part in the New York transit strike.

It is difficult to discover just what the attitude of the Department of Labor is toward the threat of the steel strike which promises to become critical at tomorrow's meeting at Youngstown by the national committee that is organizing the iron and steel workers. It is reported that at that time announcement will be made that all of the new steel workers' unions have voted by a heavy majority in favor of a strike to secure their demands. The department has made no effort to conceal its sympathy with every unionization movement, and for that reason would hardly be in a position to conciliate a controversy over the question of recognition of the union. In the present instance the department finds it desirable to avoid a direct participation for the reason that it is supposed to act in controversies in which one side or the other has appealed to it. Neither the workers nor the steel mill owners have suggested to the department that they would like to have it participate in the coming controversy.

GOVERNMENT OFFERINGS

Inventory of Aug. 11—Sales to Aug. 8—Some Tractors Not to be Sold

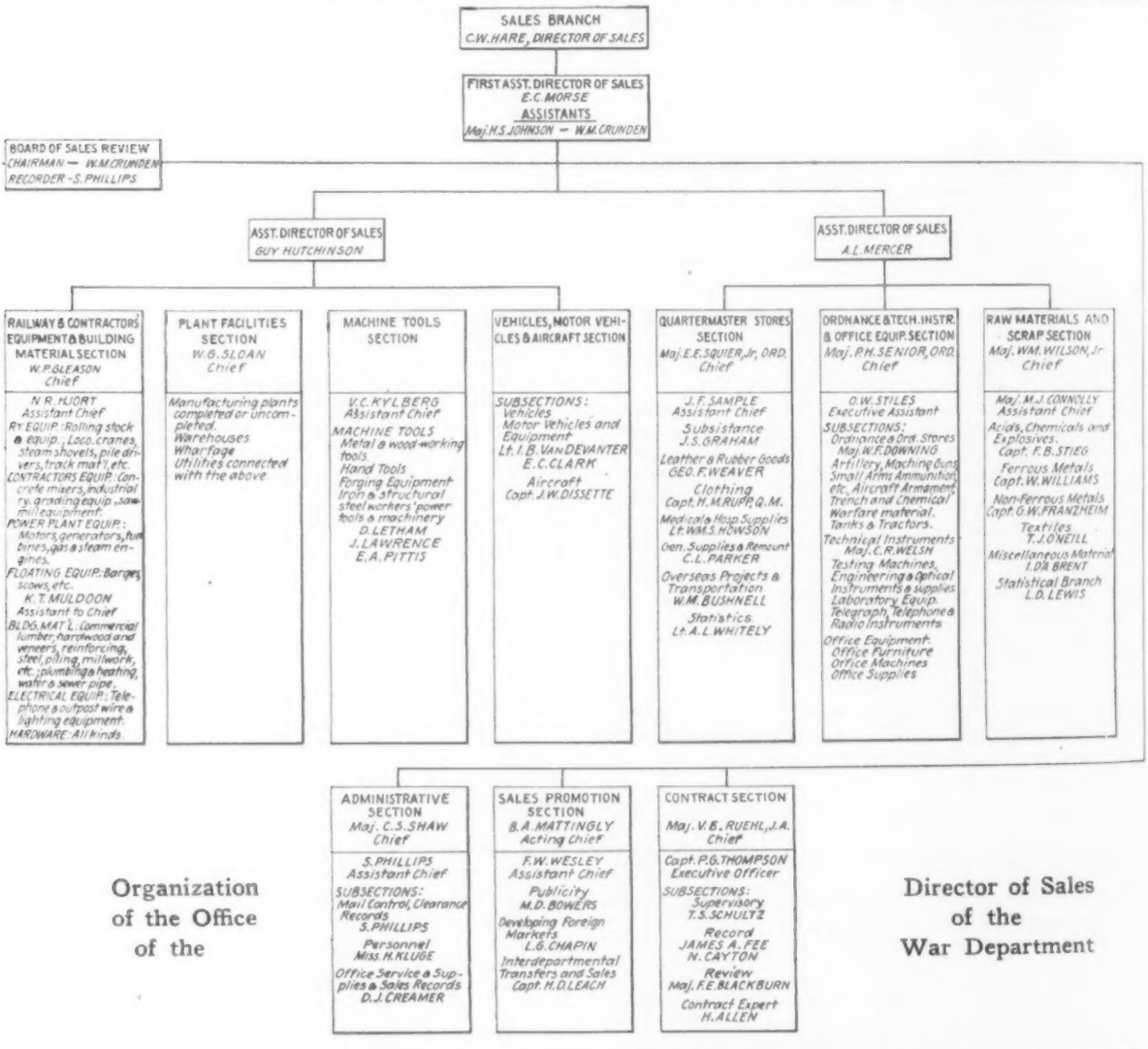
WASHINGTON, Aug. 19.—Sales of surplus property by the War Department are still proceeding slowly. Only about 25 per cent of the surplus on hand Jan. 1 has been disposed of. At the present rate it would require all of 1920 to finish the task. The present office of the Director of Sales was organized Jan. 17, 1919. At that time the surplus on hand in the department was estimated at $1,933,000,000. About one-fourth of this was sold up to Aug. 8, 1919, netting $391,329,119. The sales for the week ended Aug. 8 were $27,499,514. The total disposition of property, amounting to $123,345,239, sold prior to Jan. 1, by other War Department organizations, brings the aggregate amount received for property disposed of to date to $514,674,358.

C. W. Hare, director of sales, is still in Europe with Benedict Crowell, Assistant Secretary of War. They are trying to find an European market for supplies still in Europe, as well as surplus property on hand in the United States. So far they have only reported progress without definite reports as to actual sales.

The division of raw materials and scrap surplus is gradually getting down the totals of iron and steel on hand. The inventory dated Aug. 11 shows a total surplus in this country of 577,121 tons, divided as shown in the table below.

The surplus of other metals listed in the inventory includes: Aluminum, 86,000 tons; Babbitt metal, 26 tons; brass, 58,391 tons; bronze, 221 tons; copper, 91,333 tons, cupro nickel, 2541 tons; lead, 9036 tons; nickel ingots, 67 tons; solder, 13 tons; pig tin, 31 tons; tin foil, 33 tons; zinc, 30,087 tons; liberty silver, 5 tons;

Organization of the Office of the Director of Sales of the War Department



Inventories of Surplus Raw Materials and Scrap

Speigeleisen	769	Pig iron	5,137	Ingot	46,270	Galv. sheets	210
Ferromanganese	37	Zirconium ore	740	Billets	110,282	Shell steel	41,674
Ferrosilicon	246			Shell forgings	224,219	Grey iron	127
Total raw material, tons	6,929			Misc. forgings	56,857	Armor plate	871
Rails	919	Coil steel	72	Alloy steel	7,752	Re-inforced steel	192
Bars and rods	56,977	Copper clad steel	5	Total semi-finished steel, tons	448,544		
Structural	697	Decarb. steel	36				
Plates and sheets	4,696	Flange steel	2,098	Mach. borings and turnings	924	Misc. mixed iron and steel	35
Tin and terne plate	8,058	Gun steel	690	Heavy melting	1,539	Low phos. steel	192
Strip	845	Machine steel	226	Heavy melting nickel steel	720	H. S. solids	114
Pipe and tube	600	Misc. tool steel	13,361	Nickel steel borings and turnings	1,590	Cast steel slugs	8,386
Angle iron	155	Carbon tool steel	2,724	H. S. tool scrap	1	Cast iron	514
Band iron	11	H. S. tool steel	206			Malleable iron	1,239
Flat iron	446	Spring steel	120			Shells in process	442
Adapter steel	1,523	Shafting	2			Misc. scrap	9,350
Annealed steel	938	Bessemer bars	86				
Beveled steel	11						
Total finished steel, tons	95,502			Total scrap, tons			26,046

mercury, 116 lb.; nickel silver, 5742 lb.; silver, 6779 Troy oz.; miscellaneous scrap, 3107 tons.

Because the caterpillar tractors on hand in the War Department will be needed to equip the artillery units of the reorganized Army, the department announced that it does not contemplate selling any of them. There will be no further declaration of a surplus of caterpillar tractors. The only tractors which the War Department is now offering for sale are 14 Gray wide-drive drum tractors of the commercial type used for road building and agricultural projects. These tractors are 18-36 hp. and are offered for sale at $1,640 each, f.o.b. warehouse of the Gray plant at Minneapolis.

The surplus property division of the office of the director of purchase and storage is offering for sale four new vertical marine simplex pumps, located at Hoboken, N. J., bids for which will be opened by the surplus property officer, zone supply office, 461 Eighth Avenue, New York, at 10 a. m., Sept. 3. These pumps are vertical simplex double-action with bronze piston rods, and are the product of the M. T. Davidson Co., Brooklyn.

The St. Louis District Salvage Board, United States Ordnance Department, Fifteenth and Locust streets, offers until 11 a. m., Aug. 26, at Curtis & Co. Mfg. Co., St. Louis, about 1677 gross tons of 8-in. shell billets.

The New York office offers until 11 a. m., Aug. 25, about 22 tons of steel shells with copper bands attached at International Arms & Fuze Co., Bloomfield, N. J.

The Detroit office, Book Building, will open bids 11 a. m., Aug. 25, on about 7098 gross tons of 240-mm. shell forgings at American Car & Foundry Co., Detroit.

The Philadelphia office, 1710 Market Street, asks for proposals until 2 p. m., Aug. 27, on about 460 net tons of 1 1/32-in. hot rolled bar stock at United States Eddystone Rifle Storage Arsenal, Eddystone, Pa., and until 2 p. m., Aug. 29, about 805 net tons of 1⅞-in. cold rolled steel bars at Eddystone Munitions Co., Eddystone, Pa.

The Bridgeport office, Liberty Building, offers until 1.30 p.m., Aug. 26, the following: At P. F. Corbin Co., New Britain, Conn., about 50 tons 1¼-in. screw stock; at Stanley Works, New Britain, about 85 tons dead soft open hearth flat stock in 71-in. strips; at Page Storm Drop Forge Co., Chicopee, Mass., about 500 tons 1⅜-in. special Bessemer forging bars, 10 to 12 ft. long; at Remington Arms Works, Bridgeport, about 864 tons 1 9/16 x 1-in. hot rolled steel, and about 43 tons of 2⅛ x ⅞-in. stock.

The Toronto, Ont., office, 608 Royal Bank Building, offers until 3 p. m., Aug. 22, the following for United States consumption: At Dominion Bridge Co., Lachine, Quebec, about 230 gross tons of shell forgings and at Lachine Mfg. Co., Lachine, about 306 gross tons.

Near future sales of Government scrap and semi-finished steel through the Boston ordnance office, 19 Portland Street, by means of sealed proposals, are the following: 12,790 lb. special chrome alloy steel cores and bar stock located at the Framingham Screw Works, Framingham, Mass., bids to be in by noon, Aug. 22; 996,098 lb. 1⅞-in. Bessemer screw stock at the Scituate, Mass., proving ground storage plant, bids to be in by noon, Aug. 25; 3722 lb. cold drawn steel socket holders, tubes and adapters for Mark II fuse (scrap material), bids to be in by noon, Aug. 25, the material being located at the Worcester Mfg. Co., Worcester, Mass.

Recent Government Sales

The New York District Salvage Board of the United States Ordnance Department reports the following recent sales of material: 370,960 lb. cold rolled steel, $1.61 per 100 lb., to Frank Millner, Trenton, N. J.; 2030 sheets of 22-lb. sheet steel, 36 x 90 in., $4.10 per 100 lb., to Metropolitan Engineering Co., Brooklyn, N. Y.; 255 boxes of 107-lb. tin plate, 20 x 28 in., $5.75 per 100 lb., to Reliance Metal Spinning & Stamping Co., Buffalo, N. Y.

June Metal Working Machinery Exports

WASHINGTON, Aug. 19.—England was the largest purchaser of metal working machinery from the United States in June, 1919, according to figures compiled by the Bureau of Foreign and Domestic Commerce. The English imports totaled $2,021,182 and the French imported these tools to the amount of $1,894,272. Following are tables showing domestic exports to other countries, for the same period:

Countries	Lathes *Dollars*	Other Machine Tools *Dollars*	Sharpening and Grinding Machines *Dollars*	All Other *Dollars*
Belgium	377,971	72,840	70,712	471,522
Denmark	.....	13,872	25,460	48,875
Finland	16,509	15,304	12,946	22,810
France	254,089	282,878	181,755	1,302,460
Germany	.....	.....	.....	1,494
Italy	5,614	134,424	3,850	62,758
Netherlands	95,012	4,493	2,420	58,173
Norway	16,655	12,541	3,193	47,961
Portugal	2,420	3,575	91	3,767
Roumania	.....	626	.....	852
Russia in Europe	1,257	5,422	.....	1,473
Spain	6,455	58,976	3,802	43,968
Sweden	24,129	7,556	26,583	61,266
Switzerland	.....	350	1,088	.....
England	451,459	311,683	147,036	983,693
Scotland	2,037	895	101	15,266
Bermuda	.....	84	.....	.....
Canada	21,765	60,970	10,713	117,433
Costa Rica	.....	.....	.....	45
Guatemala	.....	.....	.....	3,250
Honduras	.....	18	2	450
Nicaragua	.....	1,395	.....	.....
Panama	3,389	313	110	460
Salvador	373	51	.....	434
Mexico	5,497	1,901	736	1,431
Miquelon, Langley, etc.	.....	.....	.....	25
Newfoundland and Labrador	.....	28	138	295
Jamaica	.....	.....	150	104
Trinidad and Tobago	.....	121	.....	.....
Other British West Indies	.....	24	.....	.....
Cuba	34,594	6,920	5,409	20,623
Dutch West Indies	.....	6	132	.....
French West Indies	.....	.....	370	.....
Haiti	.....	36	.....	.....
Dominican Republic	.....	23	.....	.....
Argentina	19,477	16,481	2,128	44,992
Bolivia	.....	77	.....	.....
Brazil	2,743	3,491	172	29,243
Chile	86,166	5,271	3,652	120,219
Colombia	.....	304	.....	2,580
British Guiana	.....	50	.....	529
Peru	5,413	2,499	1,028	1,490
Uruguay	74	7,692	.....	.....
Venezuela	50	141	60	.....
Aden	685	120	.....	.....
China	30,926	4,090	145	932,256
Japanese China	2,164	.....	168	.....
Chosen	.....	.....	.....	945
British India	7,447	13,393	3,200	156,944
Straits Settlements	.....	1,528	483	3,980
Other British East Indies	260	31	.....	350
Dutch East Indies	48,635	8,809	2,834	36,722
French East Indies	.....	.....	1,166	.....
Hongkong	5,384	569	828	996
Japan	160,269	73,699	30,730	488,221
Russia in Asia	.....	25,952	.....	5,181
Siam	418	.....	322	.....
Australia	3,939	27,632	9,326	16,209
New Zealand	5,830	3,116	791	1,495
French Oceania	.....	117	.....	.....
Philippine Islands	4,942	7,330	335	5,245
Belgian Kongo	2,906	.....	.....	3,883
British South Africa	5,946	7,889	948	6,890
British East Africa	.....	.....	.....	130
Canary Islands	.....	91	.....	.....
Portuguese Africa	.....	688	.....	98
Egypt	.....	682	.....	.....
Total	1,712,899	1,209,067	555,113	5,129,486

Overseas Shipments of Iron and Billets

WASHINGTON, Aug. 19.—A report on overseas traffic issued by the Railroad Administration indicates that all billets accumulated at the port of New York for British ports have been loaded. Cable advices have been received to load all billets awaiting shipment to France. The French have seventeen steamers at New York. One steamer carrying pig iron and cotton cleared from Savannah for Liverpool. Another is loading pig iron there for Rotterdam.

The traffic report from the Western region announces that it is planned to build a large iron and steel plant at Los Angeles, to cost about $5,000,000.

The K-B Pulverizer Co., 92 Lafayette Street, New York, has inaugurated a new department for the design and equipment of asbestos products plants.

MACHINE SHOP EFFICIENCY

A Graphic Weekly Chart Used to Show Conditions of Various Machines

In the discussion of an article on machine tools presented by Sir Alfred Herbert recently before the North-East Coast Institution of Engineers and Shipbuilders, England, C. C. Billetop pointed out that in connection with the organization of the machine shop and the introduction of expensive modern tools, it became more and more important to obtain full and effective use of the tools so that their total productive capacity might be obtained and expended as quickly as possible, in order to give place for newer and still more efficient machines. In order to keep such a check on the machines he used a graphic weekly chart here reproduced in part, which indicated at a glance the condition of the various machines in the shop at any time.

The conditions of the machines were divided into:

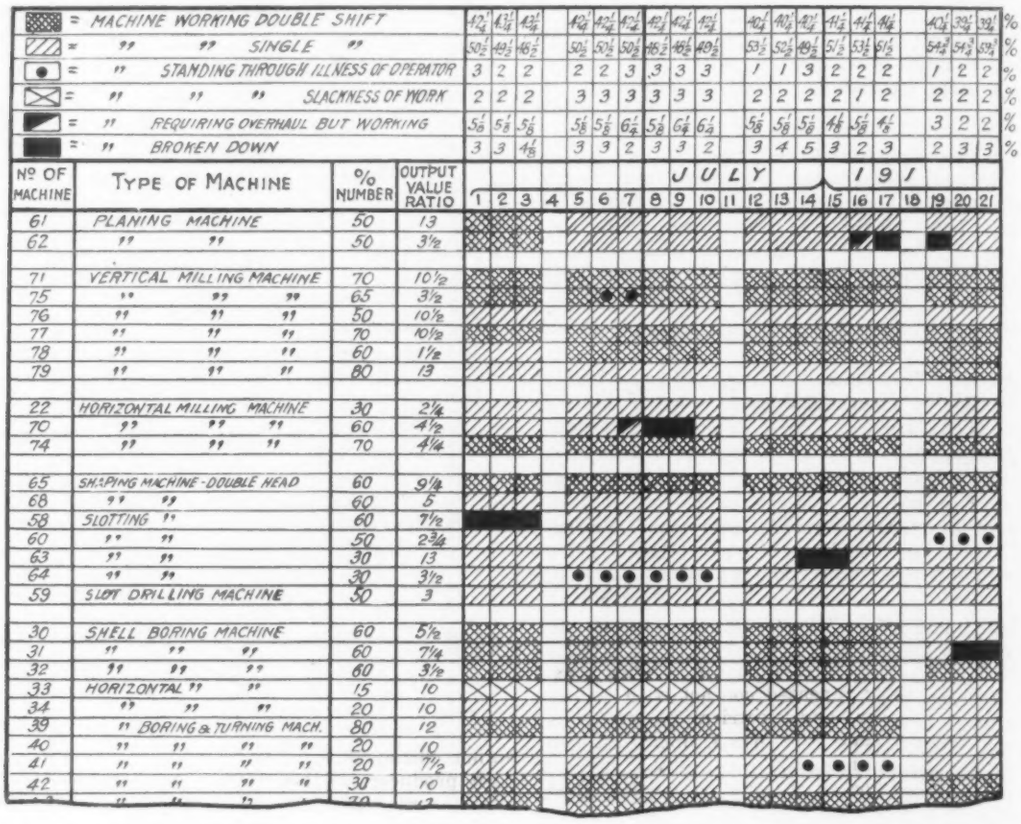
Machines working double shift.
Machines working single shift.
Machines standing through illness of operators.
Machines standing through slackness of work.
Machines requiring overhaul but working.
Machines broken down.

Each designation bore a distinct color, but in the reproduction of the chart different shading has been used for convenience of printing.

Each machine had what was called a value number, and this decided for the foreman and millwright which of two or more machines requiring overhaul and repair should get the preference. Further, there was a percentage number starting with 100 per cent for a new machine, reduced each year according to the total working hours put in, till the replacement period at zero was reached.

To compare results from old and new machines in order to aid the decision as to whether replacement would pay, several factors had to be considered, such as:

1. Class of work as regards material and labor ratios.
2. Quantities to be dealt with.
3. Unbalancing effect on other machines.


= MACHINE WORKING DOUBLE SHIFT
= " " SINGLE "
= " STANDING THROUGH ILLNESS OF OPERATOR
= " " " SLACKNESS OF WORK
= " REQUIRING OVERHAUL BUT WORKING
= " BROKEN DOWN
Nº OF MACHINE
TYPE OF MACHINE
% NUMBER
OUTPUT VALUE RATIO
JULY
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
61 PLANING MACHINE 50 13
62 " " 50 3½
71 VERTICAL MILLING MACHINE 70 10½
75 " " " 65 3½
76 " " " 50 10½
77 " " " 70 10½
78 " " " 60 1½
79 " " " 80 13
22 HORIZONTAL MILLING MACHINE 30 2¼
70 " " " 60 4½
74 " " " 70 4¼
65 SHAPING MACHINE - DOUBLE HEAD 60 9¼
68 " " 60 5
58 SLOTTING " 60 7½
60 " " 50 2¾
63 " " 30 13
64 " " 30 3½
59 SLOT DRILLING MACHINE 50 3
30 SHELL BORING MACHINE 60 5½
31 " " " 60 7¼
32 " " " 60 3½
33 HORIZONTAL " " 15 10
34 " " " 20 10
39 " BORING & TURNING MACH. 80 12
40 " " " " 20 10
41 " " " " 20 7½
42 " " " " 30 10

Graphic Chart Compiled Daily to Show the Condition of Each Machine Tool in the Shop

Manganese Ore Output Decreasing

Reports sent by operators of manganese mines to the United States Geological Survey, covering the first three months of 1919, show that shipments of the ore during that quarter were much smaller than during any other quarter since 1917. The shipments of high-grade ore were 23,937 tons, against 75,465 tons the last quarter of 1918 and 305,869 tons over the entire year. The number of shippers was only 24, against 247 in the year 1918. The shipments of low-grade ore, containing 10 to 35 per cent manganese, were 35,516 tons, against 320,455 tons the last quarter of 1918 and 916,163 tons during the year.

According to the analysis of the situation by the survey, the extraordinary decrease in shipments is due to the unwillingness of the makers of ferromanganese to increase further their rather large stocks of ore, which were purchased at high prices, especially as there is now only a small market for the alloy. Early in November, 1918, the stocks of high-grade ore and ferromanganese were equivalent to nearly nine months' supply, the price of 50 per cent ore ranged from $60 to $67 a ton, and the price of 80 per cent ferromanganese was $290 a ton. In June, 1919, the prices offered for 50 per cent ore by the few furnaces that were making purchases ranged from $25 to $35 a ton and the price of 80 per cent ferromanganese ranged from $110 to $125 a ton.

The market for ferromanganese since January has been controlled by the surplus supply of the alloy, which is largely in the hands of steel makers, who prefer to sell their stocks and bear the loss rather than hold them longer.

The United States Civil Service announces for Sept. 23 examinations superseding those of Aug. 9 for a superintendent of melting shops and a superintendent of forge shops, both at $5,000 a year. The requirements for both positions are a high school education or equivalent and 12 years' experience with three of the years as a superintendent. Candidates for these positions apply to the Civil Service Commission, Washington, D. C., for form 1312, stating title of examination desired.

REPLACEMENT OF NATURAL GAS

A Discussion of Various Methods for Producing Fuel Gas—Comparative Costs

Various methods for the production of fuel gas of particular interest to manufacturers in the Pittsburgh natural gas district, where the diminution in the supply of natural gas is periodically giving concern, were discussed in a paper on "Some Considerations with Regard to Fuel Gas," presented by Fred Crabtree, professor of metallurgy, Carnegie Institute of Technology, Pittsburgh, before the Engineers Society of western Pennsylvania. The paper gives the chemical composition and heat value of by-product coke-oven gas, bench gas (ordinary coal gas), cleaned producer gas, water gas (blue gas) carbureted or uncarbureted, and discusses their respective merits for the replacement of natural gas.

By-product oven gas is not considered by Mr. Crabtree as a desirable substitute for natural gas, for the reason that only a few large companies, usually steel companies operating blast furnaces, care to make the large investment required for by-product ovens, and such companies need all the gas they produce. It is probable, however, he states, that in the future other companies may adopt the plan of the People's Gas Co. of Chicago to build by-product ovens, distribute the gas and use the coke for making water-gas for domestic and commercial use. Ordinary distilled coal-gas or bench gas is explained as not being a desirable substitute because its cost unmixed with other gas is prohibitive for manufacturing purposes.

Water-Gas and Producer-Gas

The furnace applications of water-gas are discussed and cost figures for the installation of a plant as well as production costs are given. It is pointed out that the fuel required, either anthracite or coke, places some limitations upon the extended use of water-gas; but one or both of these can usually be obtained at a reasonable price at most of the leading industrial centers, and in this respect Pittsburgh is well favored.

The four methods for the cleaning of producer-gas, filtering, precipitation by repeated contact with zigzag surfaces, rotary scrubber, and electrical precipitation are described. It is apparent, Mr. Crabtree states, "that the cleaning of producer-gas is neither a difficult nor a very expensive process and can be accomplished by three or four different methods. The rotary scrubber apparently does not remove quite as much of the tar as do the filter and electrical precipitation methods, but it is apparently simple and reliable, giving very little trouble in operation. The figures quoted would indicate that the electrical precipitation equipment, if properly designed and installed, will give a more perfect removal of the tar with perhaps equal reliability and simplicity of operation and perhaps at a lower cost." From his analysis the author concludes that water-gas is slightly more expensive than clean producer-gas, if the costs of production only are taken into account. On the other hand, the latter requires larger gas mains, a little more power to pump it any considerable distance and, for some of the higher temperatures, requires a more expensive installation in the form of checker chambers.

Discussion

In the discussion of the paper, A. E. Blake, Surface Combustion Co., Pittsburgh, gave detailed figures of an estimate on the cost of a blue-gas plant with a daily capacity of 5,000,000 cu. ft. installed in the Pittsburgh district. Production figures are given and are compared with those of a producer-gas plant. From these figures, Mr. Blake draws the conclusion that the cost per million B.t.u. by the use of water gas is 1.56 cents more than the cost per million B.t.u. by the use of producer gas. "When one considers," he said, "the great difference in the two fuels by reason of the great dilution of producer gas by what may be termed deadwood in the form of the nitrogen, which cannot be avoided in the gasification of coal in the formation of producer gas, it will readily be understood that the small added cost of the blue water gas is nothing in comparison to the advantages to be gained. It is well known that in obtaining higher temperatures it is necessary to recuperate or to regenerate with producer-gas, whereas it is possible with blue-water gas to attain the same results in heating as with the richest natural gas." Mr. Blake stated that a local concern was about to operate a blue-water gas plant having a capacity of 1,000,000 cu. ft. a day.

Further advantages for water-gas pointed out by J. H. Taussig, engineer of design, United Gas Improvement Co., Philadelphia, were: A central plant with a distributing system with a holder to receive the gas for a working storage, and the ability to handle a gas free from sulphur for heat treatment. He pointed out that to purify a large quantity of producer gas large apparatus is required, while with water-gas the purifying is more easily accomplished.

Heat Value of Blue-Water Gas vs. Producer-Gas

In connection with the different fuel gases, some considerations which often escape notice were pointed out by Mr. Blake. "To make comparison between blue-water gas and natural gas as to heat content per foot—natural gas is 1100 and blue gas 300 B.t.u.—the question at once arises—how are you able to say you can do the same thing in the temperature line, with one as with the other? If you burn natural gas you must use about 11 volumes of air. That gives quite a total volume of mixture. The heat content of that mixture will be about 96 B.t.u. to a cu. ft. If you have water gas of 288 B.t.u. you will need about 2.14 of air to 1 of gas. The resulting volume is quite small. The heat content of a cubic foot of such mixture is about 91; so that the heat content per foot of mixture, which counts more than anything else, is very close together for the two gases. When you come to producer-gas, if you have gas of 160 B.t.u. it takes about 1.3 cu. ft. of air to burn it completely; but this mixture, due to the nitrogen which dilutes it, has a heat content of only about 72 B.t.u. per cu. ft., so that there is a decided falling off. Blast-furnace gas has about 99 B.t.u. to a cu. ft. and it takes about 0.7 ft. of air, and the resulting mixture will have about 57 B.t.u. to 1 cu. ft.

Another advantage pointed out by J. H. Taussig for water gas was that in plants having regenerators, higher efficiencies can be obtained with water-gas than with producer-gas because it requires twice as much air to burn water-gas. "If you can preheat twice as much air with approximately equal waste products," he said, "'a lower outlet temperature is obtained, which means less waste and higher efficiency with the water-gas."

Southern California Iron & Steel Co. to Expand

The Southern California Iron & Steel Co., Los Angeles, Cal., specializing in the production of iron and steel bars, bolts, nuts, etc., is planning the erection of a new plant at Huntington Park. The company has a tract there of about 25 acres fronting on the Salt Lake Railroad and extending to Slauson Avenue. It proposes to erect an initial group of eight buildings, containing open-hearth furnaces, a machine shop, forge shop, nut and rivet shop, galvanizing works, two large warehouses and office building. The entire plant is estimated to cost about $1,500,000 and will require about 12 months for completion. The equipment will consist of machinery for the production of merchant bars, round, flat and square; bolts, nuts and rivets; angle iron and kindred shapes. The company proposes to remove its present plant to the new location and increase the present force of about 400 men to 700 employees. A. C. Denman, Jr., is president and general manager.

The Electric Furnace Construction Co., Philadelphia, has sold a 3-ton Greaves-Etchells furnace for the new steel castings plant of the Dodge Steel Co., Philadelphia.

TAYLOR-WHARTON PLAN

Details of Works Council by Which Employees Share in Management

The Taylor-Wharton Iron & Steel Co., High Bridge, N. J., manufacturer of manganese steel and other special steel castings, has recently joined the ranks of those industries which are sharing with their employees the responsibilities of management. The officers of the company have long recognized the advantages of the principles underlying industrial democracy and after a study of the different plans in operation the joint council plan was generally agreed to as best adapted to meet local conditions.

High Bridge, located in the northwestern portion of New Jersey, is a town of approximately 2000 people. The steel works is the only industry and the labor requirement of between 700 and 800 employees is supplied by the surrounding country and villages, as well as the home town. The relations between the company and its employees are now and always have been pleasant and the company has been the leader in plans for the general welfare of the community.

Founded in 1742 as a producer of iron and a manufacturer of iron products, the company has continued to the present under the leadership of five generations in direct line of descent. The works have furnished the Government ordnance material for every war in which it has engaged, and they made cannon balls for the English during the French and Indian War.

Employees Vote on Proposal

The procedure in starting the plan at High Bridge was as follows: The general plan, which was in reality a tentative draft, was prepared and printed in pamphlet form. During the formative period the department heads and foremen were freely consulted and their cooperation enlisted. Next followed a mass meeting of all employees at which the plant executive presented the general principles on which the scheme was built. The pamphlets were distributed and one week later a ballot was taken to determine whether or not the employees were interested to the extent of proceeding with the plan. Of the votes cast 356 were in favor of the plan and 204 against. Then followed the elections for nine employee delegates who in joint session with nine appointed management delegates formed the constitutional convention which was charged with forming a constitution. This body decided to follow the general lines of the plan as outlined in the pamphlet and on its adoption the constitutional convention automatically became the works council. The company has three plants beside that at High Bridge, one being at Easton, Pa., with 850 employees, and two at Philadelphia, with a total of 750 employees. If it is a demonstrated success at High Bridge and the other employees want it, the plan will be extended to these other works.

Status of the Works Council

Article I of the constitution, reproduced below, gives the general provisions relating to the works council:

1. There shall be created a body to be known as the works council of the High Bridge plant of the Taylor-Wharton Iron & Steel Co., composed of representatives of the employees and representatives of the management.

2. The employee representatives shall be elected by the employees. The management representatives shall be appointed by the management, from company officials, department heads, foremen and sub-foremen and shall not exceed the employee representatives in number. Both shall at all times have an equal voice and voting power in considering matters coming before the council.

3. The articles of incorporation of the Taylor-Wharton Iron & Steel Co. and the laws of the State of New Jersey fix the final authority and responsibility for management of the company in its board of directors. Therefore, subject only to the right of the board of directors to veto or annul, the power of the works council shall be as follows:

(a) The works council may consider all matters of mutual interest as they concern the local organization, and all decisions of the works council on the above matters shall be final and binding on both parties.

(b) The works council may on its own initiative investigate and make recommendations to the management on general company policies, problems of production, etc., and the management may also refer matters to the works council for investigation and report.

Six voting divisions are created. Within each voting division, for every unit of 75 employees or major fraction thereof one representative in the works council is allowed. Only employees who are citizens 21 years old or over and who have been continuously in the company's service for one year or over are eligible to be voted for as employee representatives. All employees whose names have been on the company's rolls for 90 days prior to the date of nomination can vote in their respective voting divisions. Nominations and elections are by secret ballot. For any nominations or elections to be valid at least 75 per cent of the eligible voting list must cast ballots. Provision is made for the recall of a representative in case his services become unsatisfactory to the employees of the voting division from which he was elected.

The works executive appoints to the works council representatives and alternates from company officials, department heads, foremen and sub-foremen not to exceed in number the employee representatives. At meetings to the works council two-thirds of the employees' representatives or alternates, together with two-thirds of the major representatives or alternates, constitute a quorum.

Adjustment of Grievances

Whenever an employee is unable to adjust any matter with a sub-foreman or foreman, he presents it to his representative, who accompanies him to the operating head of the department in which the employee works. If a satisfactory settlement is not effected, the employee may order his representative to place the matter before the works council. In the works council a two-thirds' majority of the representatives present is required to pass any act. Provisions are made to insure the independent action of any representative without fear of affecting his relations with the company. The management is to deal with cases of insubordination or violations of rules as in the past, but the representatives are privileged to take up the case of any employee who, in their opinion, has not been dealt with justly.

It is provided that the plan may be terminated after July 1, 1920, if three months' notice is given by the board of directors, or in the expiration of three months after the majority of employees shall have voted in favor of its termination at a special election called for that purpose by the works council.

Chicago Pneumatic Tool Co. Erecting New Headquarters in New York

The Chicago Pneumatic Tool Co. plans moving its general offices from Chicago to New York, and toward this end is erecting an office building at 6-8 East Forty-fourth Street, New York. The structure, which is being built by Westinghouse Church Kerr & Co., Inc., is of combination steel, brick and limestone, and will comprise initially ten stories, all to be occupied by the company. The ground floor is to be an attractively designed permanent exhibition room and will contain a display of the company's products. In conjunction, a completely equipped service station will be maintained. The new building is to be ready for occupancy early in 1920.

The Exeter Machine Works, West Pittston, Pa., has been taken over by new interests and are expected to make several changes and extensions, bringing the plant up to date and enabling the more extensive and economical production of sugar mill, rolling mill, paper mill, locomotive cranes and hydraulic and special machinery, as well as breaker, hoisting and conveying machinery in which the plant has specialized. It is understood that the present working organization will be left intact. Executive and general offices will be maintained in New York.

HELPING STUDENT ENGINEERS

Plans of a New Movement of American Society of Mechanical Engineers

President Ira N. Hollis of the Worcester Polytechnic Institute, as acting chairman of the committee on relations with colleges of the American Society of Mechanical Engineers, has submitted to the council of the society a report suggesting a remedy for what it terms "the ineffectiveness of our relations with colleges due to lack of a definite program, a failure in coordination between the parent society and the student branches and a resultant reliance upon the initiative of a few individuals whose interest fluctuates from year to year."

The report has been accepted by the council and the task of carrying out the recommendations has been given to President Hollis, and it is probable that funds will be made available for the purpose.

The recommendations as adopted by the council include the following:

Scholarships and Loans

The society shall issue every spring a syllabus or suggestion of some one subject or subjects for consideration for the following year.

The authorization of 10 scholarships, not to exceed $200 each, to be awarded under rules prepared and administered by the committee on relations with colleges.

The setting aside of a fund to be invested in loans for deserving students, to be administered by the committee.

A student who has done the most effective work in a student branch in his senior year may be elected to a junior membership in the society upon graduation by the student branch and that the society remit the initiation fee and dues for the first year.

For sake of comparison of the activities of the student branches at present and those that will be carried out under the new program, the committee's analysis of the present is of interest, as follows: To get outside lecturers on technical and non-technical subjects. To get salesmen or agents from manufacturers to describe their product, usually illustrating with a stereopticon. To obtain lecturers on general subjects from members of the general faculty with which the engineering department is connected. To encourage students to speak on their feet in public meetings by giving them the periodicals and books to be reviewed orally; by having the results of theses, investigations and technical work conducted by the students described; by the delivery of brief addresses on non-technical subjects. To broaden the contact with engineering by joint meetings with other branches of engineering in the student engineering society. To bring students together, mainly for social purposes and for making them acquainted with the A. S. M. E. and its usefulness to them personally. To teach initiative by non-interference in the student branches, thus leaving to them all activities outside the classroom.

Suggesting Topics for Engineering Study

These are all to be commended, the report states. By way, however, of a suggested list of topics (such as contemplated under the proposed by-laws) the following may be enumerated as well worthy to-day of consideration by the student branch:

1. The general effect of the peace conference and the league of nations upon the work of the engineer, especially in commercial life of the nation during the next generation.
2. The method by which war disorganizes industries and the work of reconstruction that invariably follows every war. The general reconstruction that must follow this war in all the belligerent countries.
3. Standardization for manufacture and the effect of this war in forcing engineers and manufacturers to reduce the number of parts and to simplify construction of all kinds of machines. Standardization for guns and munitions.
4. Conservation of national resources, including fuel, water, soil, forests and minerals.
5. Labor and the complete readjustment of society in order that employer and employee may live together in peace. Examples of the solution of problems in different manufacturing companies.
6. The problems of transportation, national and private ownership, and the changes consequent upon improvement and rapidity of transportation.

Question of Accepting New Railroad Cars

WASHINGTON, Aug. 19.—Officials of the Railroad Administration deny charges made by C. G. Wharton, president Crucible Steel Co. of America, that 50,000 new cars are idle because the Government has not arranged for financing their purchase. The charges were made in a letter written by Mr. Wharton to Representative M. M. Garland of Pennsylvania, in which Mr. Wharton said:

"It is very apparent that the business of the country will, in the near future, suffer greatly from lack of fuel as a result of inability of shippers and consumers to obtain cars in sufficient number to lay in a reasonable reserve of coal and coke at points of consumption. Consequently, to put it mildly, it seems unpardonable that, as is generally known, there should be standing at various points on the railroads some 50,000 or more new empty cars that are sorely needed at this very moment.

"The reason these cars are not available for service, we are told, is because the Government has not reached a satisfactory conclusion with the railroads and the car builders for financing their purchase. There has been more or less talk in the papers about the Government's taking necessary action to secure release of these cars, but I understand little or no progress is being made. It is quite evident that unless you and some others who clearly appreciate the seriousness of the situation and its importance to the country as a whole get back of the movement and impress upon the Government the necessity for action, these cars will remain where they are, and as a result a few months hence thousands of American workmen will be out of employment because the plants in which they are engaged are unable to operate through lack of fuel. Not only this, but there will be a great deal of suffering among the people because of shortage of coal with which to keep their homes heated when the cold weather sets in."

Mr. Garland had the letter read in the House of Representatives. "This is simply a warning letter of the kind of which I receive many recently," said Mr. Garland, in his address to the House. "This is one of the largest employing companies in the country, employing thousands and thousands of men everywhere throughout the United States, and paying the highest wages, inasmuch as it is very skilled work. The situation presents itself to you now that we have not the carrying capacity. In many places mines are shut down for want of cars, or are working only part time, and it will be but a few months before we are up against a situation like we were year before last unless something is done to relieve it."

At the Railroad Administration offices, however, it was declared that only 45,000 open top cars had been ordered. Of these 37,000 have been built and 32,000 accepted by the railroads. But even the unaccepted cars, it was declared, are being put into service just as fast as they can be lettered and numbered, so there is to be no delay in the use of new cars, merely because of the difficulty in arranging the financing of their purchase.

O. F. S.

The Ford tractor factory, Cork, Ireland, is rapidly nearing completion, according to the *Times*, London. It will be completed in about 12 months at a total cost of about $1,000,000, and will employ about 2000 workers. A substantial portion of the raw materials used will be obtained in that section.

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Wages and Living Cost

Were it accepted that wages in the iron and steel industry should be precisely in line with the cost of living a large reduction in wages would be in order. Were wages to be set in proportion to the selling price of steel, using the relation obtaining before the war as the measure, there would likewise be occasion for a reduction in wages. Even the maintenance of present wage rates, let alone any increase, can be predicated only upon a proposition that labor at the blast furnaces and in the steel mills is entitled to much greater pay, in proportion to living costs or steel selling prices, than before the war.

For wage rate comparisons three times may be taken—the year 1899, when the iron and steel industry was experiencing a wonderful boom, the years 1913, 1914 and 1915, when wages were uniform after advances extending over a period of years, the last advance having been Feb. 1, 1913, and the period from Oct. 1, 1918, to the present time. These periods can be conveniently referred to as 1899, 1914 and the present, respectively. The hourly wage rate prevailing quite generally in the iron and steel industry of the Central West averaged about 12.2 cents in 1899 and 19.3 cents in 1914, while the present rate is 42 cents. The 42-cent rate was established Aug. 1, 1918, the subsequent advance of Oct. 1 being by way of the establishment of the basic eight-hour day, with time and a half for hours in excess of eight. Thus while the present 42-cent rate makes 42 cents an hour for eight-hour men, it makes 46.2 cents an hour for 10-hour men and 49 cents for 12-hour men.

For eight-hour men the present wages are 118 per cent above those of 1914 and 244 per cent above those of 1899. For 10-hour men the present wages are higher by 140 per cent and 280 per cent respectively. For 12-hour men they are 154 and 302 per cent higher respectively.

There is no room for argument that living costs, based on the same style of living, have increased by anything like as much as the percentages here computed. The shortest comparison represents more than a doubling, for eight-hour men from 1914 to the present, while the longest comparison represents a quadrupling, for 12-hour men from 1899 to the present time.

So much for comparison with living costs. For comparison with steel prices the basic commodity merchant steel bars may well be taken. Year by year from 1899 to 1908 inclusive ten times the hourly wage rate was a trifle less—roughly 10 per cent—than the year's average price of steel bars per 100 pounds. Now the comparison is: 100 pounds of steel bars, $2.35; ten times the rate paid eight-hour men, $4.20; ten times the rate paid 10-hour men, $4.62; ten times the rate paid 12-hour men, $4.90. The 12-hour men receive two and one-third times as large a division of the selling price of steel bars as they did from 1899 to 1908.

It would be quite aside from the real issue, therefore, to discuss iron and steel wages with relation to the cost of living or the selling price of steel, for to adopt any such criterion would be to reduce wages. It is a question of what men are entitled to now, or what they can get. Labor was more contented ten years, 15 years, 20 years ago than it has been in the past few months. The flow of immigrants to whom steel industry wage rates and steel industry hours of service were attractive has been shut off almost completely for five years and seems altogether unlikely to be resumed, yet the steel industry has increased its productive capacity by 40 per cent during that time. Obviously it is necessary to have more attractive conditions than formerly in order to keep the industry continually manned. The demand has been increased, the supply has been diminished. Some observers, therefore, have come to the conclusion lately that if in future further inducement has to be offered the inducement should preferably be that of a shorter workday rather than a greater daily compensation. A comparison between wages, living costs and steel selling prices at various times would certainly suggest this. The objection that shortening the hours would necessitate the securing of more men, when men are not plentiful, must not be taken as conclusive, for if a means can be found to

attract labor from other occupations into the iron and steel industry there is no factor by which the number who would be attracted can be gaged.

The Cheerfulness of Business

Has anyone reflected how cheerful business is to-day with its many troubles and uncertainties, by comparison with the vigorous manner in which it used to express itself when an occasional cloud appeared on the horizon? One can readily recall, if the effort is made—for the events of these days leave no leisure for natural reflection upon the past—how at recurrent intervals the entire business world professed itself upset because the Interstate Commerce Commission was consuming too much time in reaching a freight rate decision. How occasional demands of workmen for a shorter week were held to promise disaster to American industries. How the mere mention of "disturbing the tariff" was held to mean an enforced vacation for business. How the year of the quadrennial national election was always marked in advance as one in which business could not be "good." How a decline in the share market was held to presage danger—until stocks started to advance again. How, in brief, every ripple, ever wisp of cloud, every straw blown one way or another, was feared because everything might be spoiled.

Heraclites, the "dark philosopher" of ancient times, gave a proverb, "Everything flows." Everything is in a state of flux, of growing, of changing, of being recreated. Things were changing and developing before the war, but the changes were slow. There was time to complain, to fear, though eventually the outcome was likely to be favorable. If a wrong occurred, the righting of it was left to time, much time.

To-day everything is in a state of rapid flux and there is so little stable that the usual standard of appraisal of the changes is lost. Men have faith, or they could not have fought the great war, and the faith is not lost, for the war was won. They learned in the war that there were other ways of doing things from those to which they had been accustomed. It was realized that after the war there would be a different world. That new world is now being created, and men are not disposed to carp and complain, for they recognize they have no precedents with which to judge precisely the events that are now developing.

The result of all this is that the very instability of business makes it proof against "disturbance." It is the very best thing for the future of the world that all these things are developing now, that conditions are mobile, that the reactions are free to occur. It is vastly better thus than that forces bound to act in time should be suppressed, that their operation should be deferred until a later time when they would constitute a disturbance of a stable condition then existing. The cheerfulness of business to-day is undoubtedly due to a recognition of this fact. If wrong forces are acting, it is well to have to meet them now, because when everything is under test the wrongs will more speedily work out their cure.

Cleveland Strike Ended

To whom do I owe allegiance, my employer or a labor union? was the question thrust upon a conductor of an industrial train at Cleveland about two weeks ago. The conductor was entrusted with taking a train of ore-laden cars from the ore pile of the American Steel & Wire Co. to the Central blast furnace plant of the company. After he had taken the train a part of the way, he was stopped in a threatening manner by strikers, members of a local union, and ordered not to proceed. A representative of the company ordered him to deliver the load to the furnaces. The issue was squarely presented. The conductor, in a moment of weakness rather than of disloyalty to his employer, abandoned his train and was discharged. His action was followed by others leaving their jobs and about 4500 men in mills and furnaces were thrown out of employment because ore could not be delivered.

Conferences of company officials and employees followed and were conducted in a friendly manner. No outsiders—arbitrators, conciliators or union agents—were called in, and in a few days the railroad and most of the plants resumed operations. The company, while negotiations were pending, made no attempt to resume, and there was no violence or any display of ill feeling. The company made it clear that its authority must be respected and the men assented to its policy with the understanding that the offense of a few, including the conductor, would be overlooked and no record made. This having been decided, the men withdrew the demand for recognition of the union and for higher wages.

This is a rather remarkable example of how firmness of an employer, coupled with considerate treatment of employees and full, frank discussion, can end a strike. It is an experience of great value in these days of widespread industrial dissatisfaction, when many strikes are prolonged because employers or employees or both do not meet in a spirit of fairness and consider their differences without outside interference.

Prohibition and Labor Cost

The effect of national prohibition in manufacturing, upon the important elements of idle hours, labor turnover and accident hazard is being watched by practical students of plant economics. It is realized that it is too early to procure data from which to make accurate deductions, but the investigation has brought out valuable information from industrial centers of States that have been "dry" for a reasonably long time, and of other States where manufacturing communities, under local option, have fluctuated between license and no-license. The observers believe that any economic improvement which has come with prohibition as applied locally will be emphasized as the system is applied to the United States as a whole.

Statistics compiled in the recent past by individual concerns show that the abolition of the open saloon has produced a fall in percentage of idle hours and a lowering of the accident hazard, and,

while definite figures are not given, it is argued that the turnover of labor is decreased. The case of one metal working plant, employing some 6000 men, is illuminating. For years the city granted no licenses within a mile or more of the mill gates, making the distance to the nearest saloon too great to travel in the noon hour. Finally this deadline was abolished and saloons were opened close by the plant. The number of accidents increased sharply, and investigation showed that the saloon was responsible. The effect upon idle hours, however, was trivial. Then the city voted no-license. The curve of accident almost immediately descended to its former low level, and the curve of idle hours dropped off rapidly. Monday mornings and mornings following holidays no longer showed large numbers of absentees. A return to license brought with it a reaction to conditions as they had been.

As to the effect of prohibition on labor turnover, various theories are advanced. One is that a certain amount of the restlessness which leads men voluntarily to go from shop to shop and from place to place is due to intemperance. It is a known fact that where a city has voted no-license a considerable number of workers have considered it a good reason for moving to some place where a more liberal policy existed. It is without question that an important element of floating labor is made up of men who, owing to their drinking habits, cannot hold their jobs, being undependable in attendance and in the quality of their work. Perforce they must move about.

Accident hazard may become a considerable item of cost in manufacturing industry, as it affects insurance rates under workman's compensation. But any decrease in expense from that factor is probably inconsiderable when compared with that resulting from a corresponding decrease in idle hours. Even a fraction of a cent of decrease figures into a large sum of money, for the idle hour of a worker very often is the idle hour of a machine, and there are also involved the less direct losses of delayed production and deliveries. The saving that comes with any lowering of labor turnover is too well known to require comment.

It is pointed out that there may be offsets to these results of prohibition. For example, some workers resent the change, and resentment sometimes means restlessness. But doubtless influences such as this will be only temporary.

Neglected Cost Systems

The war played havoc with the cost systems of many manufacturing concerns. The feverish rush of production carried with it a disregard of expense. The effort was not to produce cheaply, but to produce on the largest scale possible. The cost system for the time being became unimportant. Scarcity of trained office help had its share in this neglect.

Since the armistice many manufacturers have caused this all-important department of management to be overhauled, and in not a few instances have been appalled at the conditions revealed. In some works prices which had been reduced with the decreased demand were found to be alarmingly close to cost and even below cost, where it had been thought a safe margin of profit remained; and the investigation brought about advances in some lines of goods.

The advice may well be heeded that every establishment which has not studied its cost system since the war ended should do so without delay. In the old days business houses looked on coldly when they saw competitors losing money on their goods. Nowadays it is recognized everywhere that a competitor who is selling without a profit is one of the worst possible factors in disorganizing the market.

The Trend in Railroad Legislation

WASHINGTON, Aug. 19.—Another week of testimony with reference to the solution of the Government's railroad problem has made it seem even less likely that Congress will be stampeded by the proponents of the Plumb plan or by the coupling of the demand for the nationalization of the railroads with threats of an industrial revolution.

The House committee on foreign and interstate commerce is apparently just as much opposed as ever to any form of Government ownership. Not a single member of the committee has so far espoused the Plumb plan in its entirety. Even Representative Sims, of Tennessee, the former chairman of the committee, who introduced the bill "by request," has repeatedly taken pains to make it clear that he has not decided to support the measure, although he favors Government ownership.

The present program of the House committee is to conclude its hearings in about three weeks and to report a bill by Oct. 1. A subcommittee of the Senate committee on interstate commerce, which held its hearings last winter, is putting the finishing touches on a bill and may place it before the Senate within two or three weeks. If the peace treaty is disposed of in time the Senate may act on railroad legislation before the House can reach it.

It seems certain that the House committee will mold its measure with the Esch bill as a basis. That measure increases the powers of the Interstate Commerce Commission, but creates little new machinery for handling the problem.

The Senate bill is likely to be far more complicated and to provide for new items of railroad and governmental machinery. The points at variance, however, are not likely to be so radical as to make it difficult to work out a compromise in conference. The Senate committee is expected to recommend a transportation board as well as a grouping of the railroads into regional districts and probably a consolidation of the existing lines into a dozen or fifteen main systems.

The principal witnesses last week before the House committee, following the conclusion of the Plumb plan testimony, included spokesmen for the National Association of Manufacturers and for the National Association of Owners of Railroad Securities. Legislation making railroad strikes unlawful and providing for adjustment of wage disputes by commissions appointed by the President were asked by the manufacturers. The security owners presented the so-called Warfield plan, which calls for a fixed return of 6 per cent with surplus earnings divided equally among the roads, the employees and the public. Others waiting to be heard included the Railway Executives' Committees, the Industrial Traffic League, the Chamber of Commerce of the United States, various live stock organizations from the Southwest, State railroad commissioners, and spokesmen for the coastwise shipping lines which would be brought under the regulation of the Interstate Commerce Commission by the Esch bill. O. F. S.

The Reading Iron Co., Reading, Pa., has placed its Keystone furnace in blast. It has a capacity of about 2100 tons per week and has been shut down since April.

BATTLESHIP STEEL PRICES CUT

Concessions on Base Prices of Plates and Shapes —Extras Waived on Minimized

WASHINGTON, Aug. 19.—Bids opened by the Navy Department for steel for the new battleships Nos. 49 and 50, to be built at the New York Navy Yard, indicate that the Carnegie Steel Co. has quoted the lowest price on steel plates. This bid was put in on a basis of 2.50c. f.o.b. Pittsburgh, while the Brier Hill Steel Co. put in a bid of 2.65c. f.o.b. Pittsburgh base, and the Midvale Steel & Ordnance Co.'s price was 2.92c. f.o.b. Brooklyn. On a basis of 27 cents freight rate, that also would be the equivalent of 2.65c. The bid of the Bethlehem Steel Co. at 2.77c., f.o.b. Sparrow's Point, also makes its price 2.65c. on the Pittsburgh basis.

On a bid for 773½ tons of cambered medium steel channels, the R. C. Hoffman Co., Baltimore, quoted 2.82c., f.o.b. Brooklyn, which is therefore lower than the Carnegie Steel Co.'s bid of 2.75c., f.o.b. Pittsburgh.

The Navy Department expects to open bids, September 5, for approximately 5000 tons of structural steel for destroyer tender No. 3, being built at Philadelphia.

The navy experts have not completed the task of working out the comparative figures of the bids submitted for battleship steel, as no two companies submitted their bids on the same basis, either as to freight charges, extras, or basing points. On angles, less than 3-in. on either leg, the Carnegie Steel Co. bid 2.35c., f.o.b. Pittsburgh; the Bethlehem Steel Co., 2.505c., f.o.b. Bethlehem; the Midvale Steel & Ordnance Co., 2.62c., f.o.b. Brooklyn. On angles from 3 to 8 in. these companies bid 2.40c., 2.605c., and 2.72c., respectively. On bars, the Carnegie bid was 2.35c., f.o.b. Pittsburgh, and the Midvale bid 2.62c., f.o.b. Brooklyn. Until the experts have compiled all the statistics for the various classes no award will be made. Bids for 384 tons of nickel steel forgings will be opened Sept. 2.

The Railroad Administration has received proposals for 100 000 tons of steel rails. They will not be passed upon, however, until later in the week, after Director General Hines has cleared his desk of the shopmen's wage question. In the meantime no details will be made public. O. F. S.

PHILADELPHIA, Aug. 20.—It is currently reported among steel companies here that the Carnegie Steel Co. bid 2.50c., Pittsburgh, on the plates required for battleships 49 and 50, and 2.40c. on shapes. These prices are not considered as showing the full extent of the price concessions involved, inasmuch as it is asserted that the leading interest waived the extra for flange steel, and also quoted net prices, or minimum extras, instead of scheduled prices. It is generally admitted that the prices named by the Carnegie Steel Co. gave the trade a shock, and there is much speculation as to the influences which caused the reductions to be made. With costs where they are the margin of profit is small even with full prices.

The bids referred to in the Washington dispatch refer to plain material required for battleships 49 and 50 which are to be constructed at the New York Navy Yard. The schedules are made up of the following items, the figures being approximate:

About 105 tons, medium steel plates, black, rectangular form, 5 lb. per sq. ft. inclusive, up to 7.65 lb. per sq. ft. exclusive, and up to 115 in. in width.

About 592 tons medium steel plates, black, of rectangular form inclusive, up to 10.2 lb. per sq. ft. exclusive, and up to 115 in. in width.

Steel plates, medium, black, 10.2 per sq. ft. inclusive and heavier, about 8617 tons of retcangular form, and up to 115 in. in width; 8617 tons of rectangular form and up to 1:5-in. in width; 3156 tons regular sketch plates; 158 tons of irregular sketch plate.

Flange steel plates, black, 10.2 lb. per sq. ft. inclusive and heavier, and up to 115 in. in width as follows: 6535 tons of rectangular form; 1765 tons straight taper and sketch plates; 88 tons irregular sketch plates.

Angles, medium steel, black, in length as may be required up to 66 ft. as follows: 362 tons, of sizes and weights up to 3 in. on both legs, exclusive; 1584 tons of sizes and weights from 3 to 6 in. inclusive on either leg; 958 tons of sizes and weights from 6 in. exclusive, up to 8 in. on either leg.

About 18 tons medium steel beams varying in height and dimension from 15 in. exclusive and heavier, and length as may be required up to 40 ft.

Channels, medium steel, in lengths as may be required up to 75 ft. as follows: 78 tons structural of various weights from 3 in. to 15 in., inclusive; 778 tons ship, of various weights, from 4 to 12 in. exclusive, to be cambered; 1603 tons ship, of various weights from 4 to 12 in. exclusive, plain.

About 1288 tons medium steel, T bars, 6½ x 6½ in. by 19.8 lb. per sq. ft., up to 30-ft. lengths.

About 81 tons, medium steel T bars 2½ x 4½ in. by 7.8 lb. per ft.

Steel bars, medium, to be of lengths as may be required up to 30 ft. as follows: 8 tons hollow half-rounds; 2 tons solid half-rounds, 20 tons of medium steel bar flats, up to 6 in. wide inclusive.

Bids were scheduled to be opened Aug. 19 for 20 tons of steel angles to be delivered at the New York Navy Yard for destroyer hulls. On Aug. 29 the Navy Department will open bids for cast steel boiler pipes and fittings to be delivered to the Mare Island Navy Yard for use at Pearl Harbor. This schedule includes 240 tons of cast-iron Class D pipe in 12-ft. lengths; 17½ tons of fittings; and a series of valves and valve appliances.

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Iron and Steel Markets

THE STRIKE SITUATION

Little Excitement Pending the Vote

Lower Plates to the Navy—Export Trade Still in Good Volume

Pending the actual test of strength, labor union claims concerning the strike vote at large steel plants have been sweeping, but with continued suppression of the fact that the unions in various mechanical lines are but a fraction of the whole body of employees. Strikes may come, as they have come in the past month, at various plants, and output may be cut down, but a general and long continued stoppage of production is not now indicated. In some directions it is known that the results of the concentrated efforts of organizers in the past two months have been disappointing.

The labor situation at Cleveland and at the Lake Superior ore docks is much improved but is not yet cleared up. The American Steel & Wire Co.'s railroad employees at Cleveland have returned. The company's blast furnace resumption is only partial, but steel works are operating. At some upper lake ports ore shipments have started.

It is significant, in view of the widespread steel works campaign for union recognition, that that demand of the wire company strikers at Cleveland was withdrawn. If other shutdowns come it is probable that some works would be allowed to remain idle indefinitely.

There has been a rapid resumption of blast furnace and steel works operations at Gary and South Chicago on the ending of the railroad shopmen's strike, but the steel workers' decision in that district is a factor of uncertainty, in view of the special activities of union organizers there.

On the part of steel consumers there is none of the hurrying forward of material that has often marked the approach of a crisis in fuel or steel or transportation, and the trade as a whole shows fewer signs of disturbance than might be expected.

The Carnegie Steel Co.'s bid of 2.50c. on close to 30,000 tons of plates for battleships 49 and 50 at the New York Navy Yard was the outstanding fact of the week in the finished material market. Other bids were $3 a ton higher, or at the March 21 schedule. On structural shapes the same company bid 2.40c., or $1 a ton below the commercial basis, while its bid on bars was 2.35c., the general market level. The total of material is about 36,000 tons.

No awards have been announced of the 100,000 tons of rails on which the Railroad Administration has taken bids.

Structural lettings in July were 74 per cent of the capacity of the country and are continuing on a good scale. In the past week awards in the East were 8500 tons and in the Chicago district 6500 tons. At the same time 21,000 tons of new work has developed.

Sentiment against price advances in finished steel is growing, sellers recognizing that while increasing costs might justify advances, integrated concerns are still operating profitably and that in the long run business will be better if the market, particularly on wire, sheets and oil pipe, where advances would be easy, is held in check.

Leading manufacturers of cold finished steel bars and shafting have abandoned the long standing list and discount basis and are selling at a net price with extras. The extras have been readjusted, so that the new prices on small sizes represent reductions.

Late cables show that German iron and steel prices, reduced to dollars, are low in comparison with American prices; for example, hematite pig iron at $28.85, billets at $32, rods at $32.20, and thin sheets at $50.50. But these are the equivalents of prices in Germany. In neutral markets, as in Holland, German prices lately reported have been above those of American products.

In the British market further sales of American skelp have been made and an order for 300,000 boxes of oil size tin plates has been divided between Wales and the United States, at about 34s. for the Welsh plates. On a number of British steel products latest quotations show advances.

Exports of American steel are still running at a high rate. August orders have kept up the June and July record, which for the independent steel companies represented the full 10 per cent of their product which they have agreed to put into the export trade.

In the pig iron market the recent advances on foundry grades, particularly the higher silicon irons, are maintained, while basic iron in the Central West show the continuance of recent concessions. More foundries are seeking iron for 1920 delivery, but such sales are sparingly made. For delivery this year August buying has been large, but rather less in the past week, July contracts having far exceeded that month's production. Chicago sales of the week included 10,000 tons of basic and 10,000 tons of basic is under inquiry for delivery in the East.

Coke has advanced sharply this week, sales to blast furnaces having been made at $4.50 to $4.75 for prompt shipment, representing 50c advance in a week. The possibility of a resumption of Government fuel control appears to figure in some buyers' calculations.

Pittsburgh

PITTSBURGH, Aug. 19.

Fear of impending labor troubles in the steel industry is casting its shadow over the market. The national committee for organizing iron and steel workers of the American Federation of Labor will meet on Wednesday, Aug. 20, at Youngstown, Ohio, when the results of the strike vote taken among those who have joined the labor organization will be announced. Union organizers say that the ballots which have been cast in various steel making centers show an overwhelming sentiment in favor of a strike if the demand of labor are not met. Chief among these demands is recognition of the unions, and this is the rock upon which relations between employers and

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 19, 1919	Aug. 12, 1919	July 22, 1919	Aug. 20, 1918
No. 2X, Philadelphia	$29.60	$29.60	$29.10	$34.40
No. 2, Valley furnace†	26.75	26.75	26.75	33.00
No. 2, Southern, Cin'ti†	31.10	31.10	28.35	36.60
No. 2, Birmingham, Ala.†	27.50	27.50	26.75	33.00
No. 2, furnace, Chicago*	26.75	26.75	26.75	33.00
Basic, del'd, Eastern Pa.	26.60	26.60	26.00	32.90
Basic, Valley furnace	25.75	25.75	25.75	32.00
Bessemer, Pittsburgh	29.35	29.35	29.35	36.60
Malleable, Chicago*	27.25	27.25	27.25	33.50
Malleable, Valley	27.25	27.25	27.25	33.50
Gray forge, Pittsburgh	27.15	27.15	27.15	33.40
L. S. charcoal, Chicago	32.75	31.75	31.75	37.85
Rails, Billets, Etc.,				
Per Gross Ton:				
Bess. rails, heavy, at mill	$45.00	$45.00	$45.00	$55.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh	38.50	38.50	38.50	47.50
O.-h. billets, Pittsburgh	38.50	38.50	38.50	47.50
O.-h. sheet bars, P'gh	42.00	42.00	42.00	51.00
Forging billets, base, P'gh.	51.00	51.00	51.00	60.00
O.-h. billets, Phila.	42.50	42.50	42.50	51.50
Wire rods, Pittsburgh	52.00	52.00	52.00	57.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.745	2.745	2.595	3.73
Iron bars, Pittsburgh	2.75	2.75	2.75	3.50
Iron bars, Chicago	2.62	2.62	2.50	3.50
Steel bars, Pittsburgh	2.35	2.35	2.35	2.90
Steel bars, New York	2.62	2.62	2.62	3.145
Tank plates, Pittsburgh	2.65	2.65	2.65	3.25
Tank plates, New York	2.92	2.92	2.92	3.495
Beams, etc., Pittsburgh	2.45	2.45	2.45	3.00
Beams, etc., New York	2.72	2.72	2.72	3.245
Skelp, grooved steel, P'gh	2.45	2.45	2.45	2.90
Skelp, sheared steel, P'gh	2.65	2.65	2.65	3.25
Steel hoops, Pittsburgh	3.05	3.05	3.05	3.50

*The average switching charge for deliveries to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	Aug. 19, 1919	Aug. 12, 1919	July 22, 1919	Aug. 20, 1918
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	4.35	4.35	4.35	5.00
Sheets, galv., No. 28, P'gh	5.70	5.70	5.70	6.25
Wire nails, Pittsburgh	3.25	3.25	3.25	3.50
Cut nails, Pittsburgh	4.925	4.925	4.25	4.00
Fence wire, base, P'gh	3.00	3.00	3.00	3.25
Barb wire, galv., P'gh	4.10	4.10	4.10	4.35
Old Material, Per Gross Ton:				
Carwheels, Chicago	$26.00	$26.00	$24.00	$29.00
Carwheels, Philadelphia	24.50	24.50	23.00	29.00
Heavy steel scrap, P'gh	20.50	21.50	20.50	29.00
Heavy steel scrap, Phila.	19.00	19.50	19.00	29.00
Heavy steel scrap, Ch'go.	20.00	20.50	19.50	29.00
No. 1 cast, Pittsburgh	23.50	23.50	22.50	29.00
No. 1 cast, Philadelphia	25.00	25.00	22.00	29.00
No. 1 cast, Ch'go, net ton	24.00	24.00	22.00	30.00
No. 1 RR. wrot, Phila.	26.50	26.50	25.00	34.00
No. 1 RR. wrot, Ch'go, net	20.50	20.50	17.00	29.75
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$4.50	$4.00	$4.00	$6.00
Furnace coke, future	4.12	4.12	4.12	6.00
Foundry coke, prompt	5.50	5.00	5.00	7.00
Foundry coke, future	5.50	5.25	5.00	7.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	24.00	22.00	23.75	26.00
Electrolytic copper, N. Y.	23.50	21.50	23.50	26.00
Spelter, St. Louis	7.75	7.25	8.00	8.87½
Spelter, New York	8.10	7.60	8.35	9.12½
Lead, St. Louis	5.80	5.50	5.50	7.75
Lead, New York	5.90	5.60	5.75	8.05
Tin, New York	57.00	70.00	70.00	92.00
Antimony, Asiatic, N. Y.	9.25	9.00	9.25	13.75
Tin plate, 100-lb. box, P'gh	$7.00	$7.00	$7.00	$7.75

employees are likely to split. Just how strong the labor movement has become in the steel mills has not been made known, but the organizers claim that great progress has been made in the past two weeks and that applications for membership are coming in so rapidly that sufficient strength will be shown to shut down a considerable part of the steel industry if the steel companies do not display a conciliatory spirit.

The apathetic attitude of the steel companies in the face of the somewhat flamboyant statements of the union organizers is difficult to analyze. Inasmuch as no demands have been made upon them as yet they are observing a policy of watchful waiting. While the possibility of a steel strike that will completely tie up the industry is by no means being disregarded, there are some who doubt that the strength of the new labor movement is strong enough to create serious difficulty. On the other hand, there are also some who show no hesitation in admitting that if a fair proportion of common labor and some of the skilled workmen, such as electricians, who have been for some time well organized, were called out the effect would be to shut down many steel plants. There is already a shortage of workers, particularly common labor, at some plants, and any further depletion of the ranks would create trouble.

Rather than give in to the probable demand for recognition of the unions, some of the steel companies will undoubtedly close their plants. The plants of a seamless tube manufacturer in this district, where labor trouble was brewing, were closed last week, and this action has been applauded as the correct procedure for other steel companies whose plants are threatened with strikes.

In view of the threatening situation, together with the sold-up condition of many of the mills, the policy of conservative selling recently inaugurated is being rigidly followed. Inquiries for next years' requirements are nearly in every case being turned down. Expectations are that higher prices will prevail after Jan. 1 on both pig iron and steel. Even now buyers would pay substantial premiums for oil country pipe if desired deliveries could be obtained, and in a few instances such premiums are reported to have been paid for January shipment.

Higher prices are also being obtained on sheets by some independents, although the leading interest adheres to the March 21 schedule, and will continue to do so, according to present indications, for the remainder of the year. Coke has shot up suddenly in the past two days, blast furnace grade now selling for $4.50 to $4.75 for prompt shipment, an advance of 50c. or more a ton. Producers of foundry pig iron will not consider any business beyond Jan. 1 at present prices and inform consumers that they fully expect $30 to $35 iron by first quarter of next year.

Leading manufacturers of cold finished steel bars and shafting have abandoned the list and discount basis of quoting, which has been in vogue since the infancy of the industry, and, effective Aug. 18, are quoting on a net price basis with extras. Fifteen manufacturers, producing 85 per cent of the total output of 700,000 to 750,000 tons a year, have already adopted the new schedule, and eight other makers, there being 23 in all in the country, are expected to follow suit. The new base price is $3.60 per 100 lb., the same as has prevailed under the list and discount method of quoting for sizes about 2½ to 3 in., but the extras show some reductions, which, however, are in the nature of a readjustment, having been carefully figured out from present production costs.

Pig Iron.—The demand for basic and Bessemer iron is not large and can be easily taken care of by the present active capacity, which has been augmented in the past few weeks, with other furnaces soon to come in blast. The only inquiry of note reported is from the American Steel Foundries for the Alliance, Ohio, plant covering 10,000 tons for delivery in the last four months of the year. This will probably be closed this

week. It is reported that the purchase of a good-sized tonnage of basic by an Ohio sheet manufacturer last week at a concession of about $1 a ton was part of a three-cornered deal, in which a large tonnage of steel bars also figured. Foundry iron shows increasing strength, and though obtainable for delivery before Jan. 1 at the March 21 schedule of $26.75 for 1.75 to 2.25 silicon, merchant furnaces in this district are a unit, so far as known, in turning down any business offered for next year. On an inquiry for 1500 tons for first half, several furnaces declined to quote any price, and stated their expectation of $30 to $35 iron for first quarter. The flurry in coke during the last few days has strengthened the determination of furnacemen to go slowly in making further sales even for this year. A radiator company at Johnstown, Pa., is in the market for 1000 tons of foundry iron for first quarter and the same tonnage for third quarter, but some sellers show no disposition to quote on this inquiry under present conditions. The Dover Furnace, Canal Dover, Ohio, blew in on basic iron on Aug. 14. Prices are firm and we quote:

Basic pig iron $25.75; Bessemer, $27.95; gray forge, $25.75; No. 2 foundry, $26.75; No. 3 foundry, $26.25, and malleable, $27.25; all per gross ton at Valley furnaces, and freight rate for delivery in the Cleveland and Pittsburgh districts being $1.40 per ton.

Ferroalloys.—Inquiry for ferromanganese is mostly for carloads, the usual quotation for domestic, 78 to 82 per cent grade, being $110, delivered. One seller reports declining a consumer's offer of $105, delivered. Though it has been persistently stated that domestic producers would meet the quotations of British makers, this apparently is not being done in all instances, the imported material having been sold at about $100, seaboard duty paid, as reported in THE IRON AGE last week. Practically all of the ferromanganese now being made is of the 78 to 82 per cent quality, consumers preferring that grade to the 70 per cent, very little of which is now being offered. Spiegeleisen is not in active demand. Some producers are asking $35, but as low as $32, f.o.b. furnace, can be done for the 18 to 22 per cent grade. For 50 per cent ferrosilicon $85 to $90 is asked for prompt delivery, with higher prices being quoted for forward delivery. Prices of Bessemer ferrosilicon are unchanged. Some sellers of silvery iron are reported to be asking higher prices, but a local interest is still quoting on the basis which has been in effect since March 21, last, as given below.

We quote 78 to 82 per cent domestic ferromanganese at $110 delivered, with a reduction of $1.50 to $1.75 per unit for lower percentages. We quote 50 per cent ferrosilicon at $85, and 18 to 22 per cent spiegeleisen at $32 to $35, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, $47.75; 10 per cent, $49.75; 11 per cent, $53.05; 12 per cent, $56.35. We quote 6 per cent silvery iron, $36.75; 7 per cent, $38.50; 8 per cent, $40.25; 9 per cent, $42.25, and 10 per cent, $44.75. About $3 per gross ton advance is charged for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which have a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Semi-Finished Material.—An inquiry for 18,000 tons of sheet bars from an Ohio sheet manufacturer is reported to have been wholly or partly satisfied by a deal in which a sale of basic pig iron also figured. The scarcity of sheet bars continues to be quite pronounced, there being practically none available for the open market. Billets are more easily obtained, though some producers are out of the market.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $38.50, 2 x 2 in. billets at $42; sheet bars, $42; slabs, $41, and forging billets, $51 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Plates.—The situation in plates is unchanged. Some business is still going at concessions, but these are not so frequent as a month or more ago. However, consumers have stated their ability to buy lots of a few hundred tons at about 2.55c. Pittsburgh. Most of the producers are quoting 2.65c. base for ¼-in. and heavier, tank quality.

Iron and Steel Bars.—Continuous bar mills are very busy, but some of the hand mills are not so active due to high cost of production, which make it impossible on hand mills for the producers to come out even on soft steel bars at 2.35c. These mills are seeking orders for special bars which take high extras.

We quote steel bars, rolled from billets, at 2.35c., and from old steel rails, 2.45c. Pittsburgh mills rolling iron bars quote at 2.75c., Pittsburgh, plus full freight rate to point of delivery.

Structural Material.—A lull in new building operations has occurred this month, and it seems unlikely that the amount of fabricated work let in August will equal that of June or July. No projects of any size in this district are reported for the past week. Some fabricators are anxious for business and are figuring prices very closely, in some instances on almost a cost basis. We quote plain material at 2.45c., Pittsburgh.

Sheets.—Demand for sheets for delivery over the remainder of this year is far in excess of the ability of some of the mills to make delivery. One large company states that it could easily book 50 per cent more tonnage than it can produce in the next four and a half months. Some consumers who believed they had fully covered their requirements for this year are asking makers to ship more than was contracted for, but in many instances this cannot be done owing to the sold-up condition of the mills. The situation is best explained by the statement of the leading interest that its clerical force is from a week to 10 days behind in booking and scheduling the orders which have been received in the past few weeks. It would be an easy matter to book considerable business for first quarter if the mills were inclined to do so, which they are not because of the uncertainty as to costs. If orders were taken for next year it would be at higher prices, probably $5 a ton above the present schedule. While premiums have been obtained by independent mills on galvanized sheets, it is reported that one or two mills are still making slight concessions on some other grades. Consumers complain of inability to get prompt deliveries on orders placed recently at concessions from the March 21 schedule. Prices on sheets are given on page 543.

Tin Plate.—Packers of food products are ordering tin plate heavily. The leading interest is virtually sold up for this year and may soon withdraw from the market. Other manufacturers are sold up for 60 to 90 days. Export demand continues brisk, inquiries coming from nearly all sections of the world, except the United Kingdom. It is said that American mills have sold comparatively little tin plate for shipment to the United Kingdom. Production tin plate for domestic use is firm at $7, and export business is also now going at that price, though concessions were being made a few weeks ago. Prices of stock items range from $6.50 to $6.75, though practically all sellers are now on the latter basis. There is fairly good demand for terne plate, prices for which are given on page 543.

Wire Rods.—Several mills are out of the market on wire rods, needing all that they produce for use in their own finishing departments. Specifications on contracts are coming in freely. Prices are given on page 543.

Wire Products.—Wire companies are taking only such business as cannot be avoided. As an indication that consumers are not finding it easy to get their wants supplied, one company states that it has had offers of orders from consumers it had not heard from in years. The leading interest continues its prices without change, but such business as some of the independents are taking is at $5 higher on wire nails and $2 higher on other wire products. Prices are given on page 543.

Hoops and Bands.—Specifications are coming in quite freely from the automobile trade, but there is room for improvement in the demand. Several mills could take on considerably more business for fairly prompt delivery. We quote hoops and bands at 3.05c. Pittsburgh, with usual extras.

Spikes.—Although standard railroad spikes are still quoted on the basis of $3.35 per 100 lb., Pittsburgh, small spikes are no longer obtainable on that basis,

the minimum quotation being $3.85 for ⅜ in., 7/16 in. and smaller, while most makers are asking $4 per 100 lb. Standard spikes in less than carloads are $3.50. Boat and barge spikes are quoted at $3.85 by one maker, but not much business is being taken; other makers are asking $4. Business is fairly good, mills operating at about 60 per cent.

We quote standard spikes, 9/16 x 4½ in., at $3.35, base per 100 lb. in carload lots of 200 kegs of 200 lb. each, and small spikes, ⅜ in., 7/16 in. and smaller, at $3.85 to $4 per 100 lb. in carload lots of 200 kegs of 200 lb. each, plus usual extras. Boat and barge spikes, $3.85 to $4 per 100 lb. in carload lots of 200 kegs of 200 lb. each, all f.o.b. Pittsburgh.

Hot Rolled Strip Steel.—The volume of business is increasing, but whether this is due to natural expansion among the consuming industries or to a desire to stock up in view of possible labor troubles is not apparent. The demand is coming from a wide variety of manufacturing plants. Prices are now said to be firm on the basis of 3.30c. Pittsburgh, for deep drawing and stamping quality.

Cold Rolled Strip Steel.—As is the case with hot rolled strip steel, the demand for cold rolled also has shown an increase during the past week.

We quote cold-rolled steel at $5.65 base per 100 lb., f.o.b. Pittsburgh, for 1½ in. and wider, 0.100 in. and thicker hard tempered in coils 0.20 carbon and under. Boxing charge 25c. per 100 lb.

Iron and Steel Pipe.—With most of the mills pretty well sold up for this year, oil companies are having extreme difficulty in placing orders for line pipe, several inquiries for which are in the market. An inquiry for 100 miles of 8-in. line pipe was turned down by some of the leading producers. It is quite apparent that higher prices could be obtained if the mills could make the desired deliveries; in fact, a few orders for January delivery are reported to have been taken at premium prices. This, however, is not confirmed, sellers generally asserting that they have no desire to take on first quarter business at present under the uncertain conditions prevailing. Discounts on iron and steel pipe are given on page 543.

Boiler Tubes.—Labor troubles have been responsible for the shutting down of the plants of the Pittsburgh Steel Products Co. at Monessen and Allenport, Pa., making seamless steel tubes. Shortly before the shut down some of the company's employees were organized and demands were about to be made for recognition of the union. Demand for boiler tubes is not brisk. Discounts are given on page 543.

Cut Nails.—The La Belle Iron Works, Steubenville, Ohio, the principal maker of steel cut nails, has withdrawn from the market except on less than carload lots, and will take very little business of any kind. Its price for carloads is 4.75c., Steubenville, but this is nominal, recent business in less than carloads having been done at 4.85c., Steubenville, to which a freight rate of 19½c. to Pittsburgh is added. Jobbers are asking about $6 out of store.

Bolts, Nuts and Rivets.—The demand continues fairly good, and the new prices are being generally maintained so far as reported. These are given in detail on page 543.

Coke.—A flurry in coal and coke during the past few days has caused a sharp advance in coke prices, sales of blast furnace coke having been made on Monday and Tuesday of this week at $4.50 and $4.75 per net ton, Connellsville, for prompt shipment. Some was sold late last week at $4.25, but this could not be duplicated. Most consumers are covered wholly or in part on sliding scale contracts in which the price is figured on the basis of 6 or 6¼ tons of coke for 1 ton of basic pig iron. With basic iron at $25.75 the contract coke price on a 6¼ to 1 basis figures out $4.12, but sellers say that they would make no more contracts at that ratio. A leading seller says it would ask a ratio of 5 to 1, which would make a contract price of $5.15. No new contracts, however, have been made on that basis. Perhaps the principal cause for higher prices is the demand for by-product coking coal, sales of which have been made at $2.75 to $3. Other factors are the increasing shortage of cars and labor at the ovens. We note the sale of 3450 tons of furnace coke for export at $5 at Connellsville oven. The high prices now being paid for coal make it more profitable for some coke producers to sell coal than make coke.

Steam and gas coal are also very much in demand. The possibility of the Government's again taking a hand in the situation by bringing the Lever bill to life is being reckoned with. Good 72-hr. coke is not obtainable for either prompt shipment or on contract for less than $5.50, and some sellers are asking up to $6. The estimated production of coke for the week ended Aug. 9 was 222,170 tons, which brings the output to the level of the first weeks of March. The net gain in the number of active ovens in that week was 268. The H. C. Frick Coke Co. added 366 ovens at 13 of its plants, while the Merchant ovens decreased by 98. The region as a whole was operating 55.7 of its ovens week before last.

Old Material.—While demand for steel-making scrap in the Pittsburgh district has fallen off, this does not seem to have greatly disturbed dealers who have stocks on hand. There is no scramble to sell at the prices which possibly could now be obtained. Brokers with short orders are offering about $20.50 to $21, but without much success in getting supplies. The scrap trade believes that the steel mills must come into the market again soon, and they will probably await that time in the hope of getting the high prices which were easily obtained two or three weeks ago. It seems probable that the steel companies decided that heavy melting steel at $22.50 or $23, the prices which were paid, was more expensive to use than pig iron, and accordingly they ceased buying. The embargoes which followed the railroad shopmen's strikes had some influence on the situation. At present there is very little demand for steel-making scrap except among the dealers themselves. The market for rerolling rails is weaker, and the high prices which have been paid in recent weeks are no longer obtainable. Local consumers will not pay above $24, delivered. Some sales have been made, however, in nearby territory at higher prices, notably one for delivery in central Ohio at $30. On some of the items given below prices are not quotably lower, though the market is weaker. Transactions have been few in number. We quote as follows for delivery at consumers' works:

Heavy steel, melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$20.50 to $21.00
No. 1 cast, for steel plants	23.50 to 24.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	26.50 to 30.00
Compressed steel	18.00 to 19.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district	16.00 to 16.50
Bundled sheet stamping	16.00 to 16.50
No. 1 busheling	18.00 to 18.50
Railroad grate bars	18.00 to 18.50
Low phosphorus melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier	25.00 to 25.50
Iron car axles	31.00 to 32.00
Locomotive axles, steel	31.00 to 32.00
Steel car axles	28.00 to 29.00
Railroad malleable	20.00 to 20.50
Machine shop turnings	13.50 to 14.00
Cast iron wheels	25.00 to 26.00
Rolled steel wheels	22.00 to 23.00
Sheet bar crop ends (at origin)	23.00 to 24.00
Heavy breakable casts	21.00 to 21.50
Cast iron borings	15.50 to 16.00
No. 1 railroad wrought	22.00 to 23.00

Officials of the newly formed Slick-Knox Steel Co., with a plant at Wheatland, Pa., expect to commence deliveries in a month and a half. The company will manufacture automobile gear ring blank flanges, patented return ells, steel water-cooled tuyeres, side frames for cars, bosh plates for blast furnaces, frames for automobiles and other specialties.

Chicago

CHICAGO, Aug. 19.

As a result of the termination of the railroad shopmen's strike last Thursday the leading interest is rapidly resuming operation of those facilities which were idle. Seven blast furnaces have been blown in, five at Gary and two at South Chicago, making the total number now operating nine at the former plant and six at the latter. All of the open-hearth departments with the exception of duplex furnaces at Gary are now running and most of the finishing mills with the exception of the rail mill are working. The leading independent which was not affected by the strike is still operating at about 75 per cent of ingot capacity. Now that the transportation tie-up has been brought to an end, the mills are confronted with the possibility of difficulties with their own employees. Organizers of the American Federation of Labor have been taking a strike vote among iron and steel workers and have publicly announced that the returns are almost unanimously in favor of a walkout. What proportion of the men have joined this movement the mills have been unable to determine. While it is felt in some quarters that the majority of the workers will remain loyal to their employers, the situation is admittedly threatening.

Business continues active in most products. There is an increasing domestic demand for billets and export inquiries for 25,000 to 30,000 tons have been received. The volume of plate business is not yet equal to the capacity of the mills but the demand for shapes continues encouraging. Fabricating awards during the past week aggregated over 6500 tons. Makers of sheets, mild steel bars, wire products and bolts and nuts have all accumulated large backlogs. Recent orders for pig iron include 10,000 tons of basic, 2000 tons of basic and 2000 tons of foundry iron. A large melter is inquiring for 10,000 tons of basic for delivery at an Eastern plant. Scrap is dull.

Ferroalloys.—Except for an inquiry for 175 tons of ferrosilicon, 75 per cent, the market is inactive.

We quote 80 per cent ferromanganese at $110, delivered; 50 per cent ferrosilicon, at $80 delivered; spiegeleisen, 18 to 22 per cent, $35, furnace.

Bars.—Steel bars continue to be one of the strongest of finished products from a market standpoint. Although a few sellers believe that the threatening steel strike is influencing prospective buyers to hold new inquiries in abeyance, this is not the general feeling of the trade. In fact, the principal difficulty confronting the mills is to take care of new orders, particularly those calling for early delivery. Specifications and orders for rail carbon bars are heavy, but the diminishing stocks of old rails in mill yards and the present high price of rerolling rails are serving to restrict the business which producers are willing to book. A gradual improvement in the demand for bar iron is evidenced by a betterment in mill operation. A representative local mill is now operating at 75 per cent of capacity, the best record up to date this year.

Mill prices are: Mild steel bars, 2.35c. Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.62c., Chicago; rail carbon, 2.55c. mill. Jobbers quote 3.37c. for steel bars out of warehouse.

Pig Iron.—Although melters are not contracting as heavily as heretofore, the market for spot iron is very active. Consumers have bought rather generously for their last half requirements, but it is felt that many have not covered for their full needs and will have to buy again before the end of the year. That some difficulty may be experienced in securing iron in the closing months of the year is indicated by the present condition of the Northern furnaces. Bay View is out of the market until 1920, having sold against both its active and idle stack, which will be blown in shortly. It expects to blow in a Mayville stack some time this week and an additional Federal furnace about Sept. 1. Recent purchases include 10,000 and 2,000 tons of basic respectively bought by St. Louis companies and 2,000 tons of Northern No. 1 foundry ordered by a Milwaukee melter. A large interest has entered the market for 10,000 tons of basic for delivery at an Eastern plant. Southern foundry has advanced to a minimum of $27.50 and a number of furnaces are charging $27.75. The differentials above the lower base are irregular and were published in this column two weeks ago. The $27.75 minimum, however, takes the usual differentials for silicon content, the advance being $1 for each grade. Charcoal iron has also advanced, the base price for delivery during the remainder of this year being $30.25 f.o.b. furnace, or $1 above the previous quotation, while the price for first quarter delivery is $31.25 furnace. Charcoal iron furnaces have sold most of their 1919 output and have taken a number of orders for delivery in the first quarter of next year.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and no not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, average silicon, 1.50, second half delivery, f.o.b. furnace, average freight to Chicago, $2.50 (other grades subject to usual differentials)	$30.25
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	28.00
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	26.75
Northern high-phosphorus foundry	26.75
Southern coke, No. 1 foundry and No. 1 soft, silicon, 2.75 to 3.25	$34.75 to $35.75
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	33.60 to 34.00
Southern foundry, silicon, 1.75 to 2.25	32.50 to 32.75
Malleable, not over 2.25 silicon	27.25
Standard Bessemer	27.95
Basic	25.75
Low phosphorus (copper free)	40.00
Silvery, 7 per cent	42.05

Sheets.—Mills are well booked and find it difficult to entertain new business calling for early delivery. The leading independent, for instance, is no longer quoting and cannot insure delivery on blue annealed and black sheets until November and December, respectively. The Gary Sheet Mills, which were shut down on account of the railroad strike, are resuming operation.

Mill quotations are 4.35c. for No. 28 black, 3.55c. for No. 10 blue annealed, and 5.70c. for No. 28 galvanized.

Jobbers quote Chicago delivery out of stock; No. 10 blue annealed, 4.57c.; No. 28 black, 5.62c., and No. 28 galvanized, 6.97c.

Plates.—The foremost independent has sufficient business on its books to keep its mill running until the close of the year. On the other hand, the leading interest with a much larger capacity as well as other mills selling in this district could take care of a considerably larger tonnage than has thus far been booked. In general, current inquiries call for immediate shipment, a condition which is not conducive to the accumulation of a backlog. There is still immediate tonnage required for car repairs that has not yet been placed by Western car builders and additional orders from the Pacific shipyards are expected. As a result of the termination of the railroad shipmen's strike, the plate mills of the leading interest at Gary and South Chicago have resumed operation.

The mill quotation is 2.65c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. for plates out of stock.

Structural Material.—Undoubtedly the mills would now have larger bookings if the local demand had not been stifled by the tie-up of local building. Notwithstanding the Chicago lockout, which is still in effect, the business emanating from other sources is decidedly encouraging. The Texas Co., Houston, Tex., has awarded 1750 tons for 14 structures to the Kenwood Bridge Co., Chicago, and the Eclipse Gas Stove Co., Rockford, Ill., has let 652 tons for a foundry to the Rochester Bridge Co., Rochester, Ind. Local mills have received an inquiry from a Southern interest calling for 1800 tons of shapes for two collieries. Recent fabricating awards include:

Columbia Steel Co., Mill Building, Pittsburgh, Cal., 500 tons, to Dyer Brothers.

California-Hawaiian Sugar Co., warehouse, San Francisco, 500 tons, to California Steel Co.

Interstate Iron & Steel Co., extension to open-hearth building, South Chicago, 500 tons, to Worden-Allen Co.

Northern Paper Mills Co., three buildings, Green Bay, Wis., 425 tons, to Worden-Allen Co.

Idaho State Capitol, Boise, Idaho, 629 tons, to Omaha Structural Steel Co.

Gisholt Machine Co., machine shop addition, Madison, Wis., 250 tons, to Worden-Allen Co.

Danville Malleable Iron Co., foundry, Danville, Ill., 241 tons, to Decatur Bridge Co.

Middle West Utilities Co., power station, Tulsa, Okla., 235 tons, to Kansas City Structural Steel Co.

Bozeman Bank, Bozeman, Mont., 200 tons, to the Bethlehem Fabricators, Inc., Bethlehem, Pa.

Peshtigo Pulp & Paper Co., paper mill, Peshtigo, Wis., 169 tons, to Northwestern Iron Works.

Dodge Mfg. Co., Mishawaka, Ind., 150 tons, to Elkhart Bridge & Iron Works.

Missouri Pacific Railroad, deck girder spans, 120 tons, to Virginia Bridge & Iron Co.

Missouri, Kansas & Texas Railroad, oil storage tank, 144 tons.

Industrial Building Co., Chicago, 106 tons, to Union Foundry Co.

New inquiries include:

Interstate Iron & Steel Co., Mill Building, South Chicago, 300 tons.

Substructure, Madison Street bridge, Chicago, 300 tons. Fitzsimmons & Connell Dredge & Dock Co., general contractor.

Studebaker Corporation, plant addition, South Bend, Ind., 900 tons, James Stewart & Co., general contractors.

Garage, Atlantic, Iowa, 150 tons, Vorse & Krach, Des Moines, Iowa, architects.

American Steel Foundries, machine shop and extension to foundry, Granite City, Ill., 900 tons.

Ohio Steel Foundry Co., Lima, Ohio, 475 tons, bids being taken by Frank D. Chase, Inc., Chicago.

Wayne Oil Tank & Pump Co., Fort Wayne, Ind., tank shop, 250 tons.

Dryden Rubber Co., power house, Chicago, 55 tons.

The mill quotation is 2.45c. Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote $3.47 for material out of warehouse.

Wire Products.—Specifications are heavy and the pressure for prompt shipment insistent, indicating that jobbers stocks are being absorbed as fast as they are received. Mills have accumulated large backlogs and are not particularly anxious for new business, preferring to take care of the requirements of their regular customers. One mill is taking no orders except for fence wire. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 543.

Rails and Track Supplies.—The prospective order for 100,000 tons of rails by the Railroad Administration has created some interest because of the possibility that part of the tonnage may be rolled here. A fair amount of business from street railroads, industrial plants, etc., continues to be booked. The local mills of the leading interest, which were closed on account of the railroad strike, have not yet resumed operation. Current inquiries for both heavy and light rails calls for immediate shipment and this is true of track fastenings also.

Standard railroad spikes, 3.35c. Pittsburgh. Track bolts with square nuts, 4.35c. Pittsburgh. Steel tie plates and iron angle bars, 2.75c. Pittsburgh and Chicago; tie plates, iron, 2.90c., f.o.b. makers' mills. Light rails, 2.45c. f.o.b. makers' mills, with usual extras.

Cast Iron Pipe.—The preponderance of orders for small sizes is interfering with efficient shop operation. The larger cities are beginning to inquire more freely, but it is felt that because of the lateness of the season and the difficulty of making early deliveries on large pipe, orders for smaller sizes will continue the rule. Fairmont, N. D., and Detroit took bids yesterday on 200 tons and 3080 tons, respectively. Council Bluffs, Iowa, has awarded 125 tons to the United States Cast Iron Pipe & Foundry Co.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $58.80; 6-in. to 16-in., $55.80; class A and gas pipe, $2 extra.

Bolts and Nuts.—Specifications are heavy and orders are being taken by makers with increasing difficulty. A number of inquiries have been made on 1920 requirements, the deliveries asked for ranging from first quarter to the entire year. As manufacturers are covered on their raw material for the remainder of the year only, they are not disposed to quote on this business. Persistent activities by labor agitators are causing makers to fear difficulties with their employees. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 543. Jobbers quote:

Structural rivets, 4.72c.; boiler rivets, 4.82c.; machine bolts up to ⅞ x 4 in., 50 and 5 per cent off; larger sizes, 40 and 5 off; carriage bolts up to ⅞ x 6 in., 45 and 5 off; larger sizes, 30 and 10 off; hot pressed nuts, square tapped and hexagon tapped, $1.85 off; coach or lag screws, gimlet points, square heads, 50 and 5 per cent off. Quantity extras for nuts are cancelled.

Old Material.—Although the strike of railroad shopmen was brought to an end last week, the threatening nation-wide walkout of iron and steel workers has prevented the scrap market from recovering from the lull induced by the late transportation difficulties. Prices are at about the same level as a week ago, a few having suffered further declines. In the absence of activity on the part of both dealers and consumers quotations are nominal. The Michigan Central has issued a list of 3000 tons, including 1350 tons of rerolling rails. The Pere Marquette has advertised 400 tons. On Aug. 29 the Ordnance Department will take bids on 16,000 tons of shell forging lying in the yards of the Pressed Steel Car Co., Hegewisch, Ill. On Aug 27 it will offer 776 tons of forgings; on Aug. 28, 98 tons of 6-in. square electric nickel steel blooms and 63 tons of 10½-in. octagonal blooms, and on Aug. 29, 324 tons of cold drawn free cutting Bessemer screw stock.

Per Gross Ton

We quote delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	$25.00 to $26.00
Relaying rails	35.00 to 45.00
Carwheels	26.00 to 27.00
Steel rails, rerolling	29.00 to 30.00
Steel rails, less than 3 ft.	23.50 to 24.00
Heavy melting steel	20.00 to 21.00
Frogs switches and guards, cut apart	20.00 to 21.00
Shoveling steel	20.00 to 20.50

Per Net Ton

Iron angles and splice bars	$24.00 to $25.00
Steel angle bars	20.50 to 21.00
Iron arch bars and transoms	26.00 to 27.00
Iron car axles	29.00 to 30.00
Steel car axles	26.50 to 27.00
No. 1 busheling	17.00 to 17.50
No. 2 busheling	12.00 to 12.50
Cut forge	19.50 to 20.00
Pipes and flues	15.75 to 16.25
No. 1 railroad wrought	20.50 to 21.50
No. 2 railroad wrought	19.50 to 20.00
Steel knuckles and couplers	21.00 to 21.50
Coil springs	21.50 to 22.00
No. 1 cast	24.00 to 25.00
Boiler punchings	23.00 to 23.50
Locomotive tires, smooth	21.50 to 22.00
Machine shop turnings	10.00 to 10.50
Cast borings	12.25 to 13.25
Stove plate and light cast	21.50 to 23.50
Grate bars	21.00 to 21.50
Brake shoes	20.00 to 21.00
Railroad malleable	20.00 to 21.00
Agricultural malleable	19.50 to 20.50
Country mixed	16.00 to 17.00

J. L. Dixon, who was instrumental in the development of the Gronwall-Dixon furnace, is now associated with the T. W. Price Engineering Co., New York, as metallurgist and electric furnace engineer. He has had a very wide experience in the design, installation and operation of electric furnaces, covering a period of some eleven years. The company will construct and install an electric furnace to be known as the Price-Dixon electric furnace. In addition the Price company will continue the practice of consulting engineering, specializing as heretofore in the design of foundries, rolling mills, forge shops and also special machinery and processes. The company has recently completed the design and purchased equipment for a rolling mill to be installed in Japan and is also at the present time engaged in making plans for a foundry for making cast iron pipe by the new process known as the "centrifugal cast iron pipe process," which has proved very satisfactory in an installation at the plant of the National Iron Works, Toronto, Can.

Philadelphia

PHILADELPHIA, Aug. 19.

While the general situation is but little changed, some new irregularities present themselves. With makers of plates and shapes doing their best to hold to 2.65c. and 2.45c., Pittsburgh, respectively, they regard with anything but equanimity the action of the leading interest in quoting 2.50c. for plates and 2.40c. for shapes on material needed for battleships 49 and 50 to be built at the New York Navy Yard. Not only are they displeased with the cut in the base price, but they also point to the waiving of the extra for flanging steel and the quoting of net extras on various products as likely to have an adverse effect on private consumers. The makers of shapes insist that their quotation is 2.45c., Pittsburgh, yet they admit that fabricators are cutting deeply to get what little business in their line is stirring in this district, their desire being to keep their shops occupied and their organizations intact. Pig iron, with further withdrawals of producers from the market, shows a firmer tendency, although the demand for steel-making iron is flat. Scrap is softer, and heavy melting steel, reflecting hesitancy to buy in Pittsburgh, is marked down 50c. a ton. At $19.50 about 15,000 tons were taken by an eastern Pennsylvania structural mill. The large hangar, to take several thousand tons, which the Government will erect at Lakehurst, N. J., is not yet placed. It may be redesigned, and bids will be reopened Sept. 9. In those lines which are busy there is no change. Plates show a little betterment in regard to the demand from miscellaneous sources. There is a good call for cold drawn and turned and polished shafting, the specifications against third quarter contracts being heavy. Deformed bars for concrete reinforcing, on which the extra is waived, are in good demand also. The steel bar and sheet mills are about filled up.

Bolt and nut makers are selling against a new price schedule effective Aug. 15. A new classification card is out for cold-drawn steel.

Consumers persist in offering business to English makers of ferromanganese at prices that mean substantial concessions and which the domestic producers must meet if they would get business. A Western user has offered to take a substantial tonnage at $95, delivered the price being equal to $90 seaboard. The English makers have made known their willingness to accept $100, seaboard, and business has been done at that level.

Pig Iron.—The market is quiet, but firm. That there is but little doing in foundry iron is not surprising in view of the season and the fact that the aggregate of July sales was far beyond the rate of production in that month. They specified foundry mostly. Basic is inactive. Should a good demand for it develop suddenly it is deemed certain that foundry grades would jump in price, the advancing market bringing activity in buying, against which the supply would be smaller, inasmuch as some of the furnaces concentrating on foundry would then have to give attention to the production of basic. The last sale of basic was at $26, furnace. With the further withdrawal from the market of makers who have booked to their limit or close to it, the range of quotations shows a continued tendency to contract. Practically all the eastern Pennsylvania producers now ask $30, furnace, but some would still accept less where competition enters. At $30, furnace, several small and medium-sized lots have been taken, among which may be mentioned 800 tons for which $31.10 was paid. Even a furnace the product of which takes a freight of $2.40 to Philadelphia, quotes $30, furnace. It is nearly sold up. A Buffalo producer has withdrawn, and others are practically out of the market. None care to sell into 1920 because of uncertainties heretofore referred to, these including labor, freight, fuel, etc. There is talk of $6 coke for next year. A Virginia producer continues to quote on the basis of $32.10, Philadelphia, for No. 2 (sil. 1.75 to 2.25) and $33.10 for No. 2 X (sil. 2.25 to 2.75), and has recorded several sales at these prices. A shortage of freight cars is hampering the Virginia furnaces, as the cars which leave with shipments are not returned to the extent they should be. Better freight conditions in New England are speedily expected to follow the return to work of the railroad shopmen. Standard low phosphorus is firmly held at $38, furnace. It is not understood that sales have been made at this level, but the makers refuse to consider less. Recent sales at $35, furnace, were made under qualifying circumstances.

Eastern Penna. No. 2 X, 2.25 to 2.75 sil.	$29.60 to $31.10
Eastern Penna. No. 2 plain, 1.75 to 2.25 sil.	28.60 to 30.10
Virginia No. 2 X, 2.25 to 2.75 sil.	33.10
Virginia No. 2 plain, 1.75 to 2.25 sil.	32.10
Basic	26.60 to 27.10
Gray forge	26.60
Malleable	(nominal) 28.35
Standard low phosphorus (f.o.b. furnace)	38.00
Copper bearing low phosphorus (f.o.b. furnace)	35.00

Ferroalloys.—Large consumers of ferromanganese have evidently set out to bring about a reduction in prices by making overtures to the representatives of English makers. It is generally conceded that English 76 to 80 per cent can be had at $100 seaboard, having been brought to that level by the acceptance of consumers' offerings. Now comes another offer, a Western consumer being willing to take a large tonnage at $95, delivered, which would be about equivalent to $90, seaboard. The offer was submitted to the British principals by cable, but there is some doubt about its acceptance. Spiegeleisen which has been active in carload lots is stronger at $36, furnace. Ferrosilicon is strong at $85 to $90, delivered, carload lots. Blast furnace ferrosilicon is scarce owing to the continued strike troubles in Jackson County, Ohio, and an active market for the product of the electric furnace is developing.

Plates.—From miscellaneous sources has come enough demand for plates to constitute a decided betterment for some mills. A number of contracts, extending to the end of the year, have been booked and specifications have been good. In view of the opinion of most makers that the 2.50c., Pittsburgh, price had about disappeared, news that the leading interest had bid 2.50c., Pittsburgh, on plates for war vessels came as a shock. It was further reported that the extra for flanging steel had been waived by the same interest and that minimum or net extras were quoted. The local quotation is 2.895c., Philadelphia.

Structural Material.—While plain material is generally quoted at 2.45c., Pittsburgh, or 2.695c., Philadelphia, fabricators are cutting their prices deeply to get what little business is stirring in this territory. They desire to keep their plants going and their organizations intact even if they do not see a fair profit. Hereabouts there is but little of interest in the fabricating line, aside from the huge hangar which the Government is figuring on building at Lakehurst, N. J., which will require a tonnage variously estimated at from 6000 to 10,000 tons. Bids will be reopened Sept. 9, and it is not improbable that the structure may be redesigned. It is to house dirigible balloons, and will require high and far reaching members.

Bars.—A prominent maker continues practically out of the market on mild steel bars. Concrete reinforcing deformed bars are more active. On these the usual extra is being waived. Iron bars are quiet, producers at Lebanon still being halted by strikes involving recognition of the union. We quote soft steel bars at 2.595c., Philadelphia, and bar iron at 2.745c., Philadelphia. Double refined iron is 1c. per lb. extra.

Sheets.—The makers are comfortably filled to the end of the year, and no price concessions are reported. We quote Philadelphia delivery as follows: No. 10 blue annealed, 3.795c.; No. 28 black, 4.595c., and No. 28 galvanized, 5.945c.

Bolts and Nuts.—The Emergency Fleet Corporation took bids yesterday on several carloads of galvanized bolts, on which there were eight bidders, their quotations ranging from 4.85c. to 7.95c. Sellers are operating on new prices effective Aug. 15.

Coke.—In this territory there seems to be but

little unusual interest in the coke situation. Prompt foundry can be had at $5, ovens, but up to $5.50 is asked. Furnace coke is reported a little stronger, but no test of the market has been made.

Old Material.—Melting steel has been purchased in lots amounting in the aggregate to 15,000 tons at $19.50, a small purchase has been made at $19.25, and some consumers are bidding $19, delivered. The decline is said to be due to the withdrawal of Pittsburgh as an influence in this market because of fears inspired by the labor situation. Government scrap is declared to be less of a factor, inasmuch as Government representatives have refused to sell at present prices. Rolling mill grades continue quiet.

No. 1 heavy melting steel	$19.00 to $20.00
Steel rails, rerolling	25.00 to 26.00
No. 1 low phosphorus, heavy, 0.04 and under	24.50 to 26.00
Carwheels	24.50 to 26.00
No. 1 railroad wrought	26.50 to 27.50
No. 1 yard wrought	23.00 to 24.00
No. 1 forge fire	15.00 to 16.00
Bundled skeleton	15.00 to 16.00
No. 1 busheling	16.00 to 17.00
No. 2 busheling	13.00 to 14.00
Turnings (short shoveling grade for blast furnace use)	14.50 to 15.50
Mixed borings and turnings (for blast furnace use)	13.00 to 14.00
Machine-shop turnings (for rolling mill and steel works use)	15.00 to 15.50
Heavy axle turnings (or equivalent)	16.50 to 17.00
Cast borings (clean)	14.50 to 15.00
No. 1 cast	25.00 to 26.00
Grate bars	20.00 to 21.00
Stove plate	20.00 to 21.00
Railroad malleable	20.00 to 21.00
Wrought iron and soft steel pipes and tubes (new specifications)	19.50 to 20.50
Ungraded pipe	15.00 to 16.00

Buffalo

BUFFALO, Aug. 18.

Pig Iron.—While the situation is not so active in inquiry and sales as was noted a week ago there has been a good steady market for all grades of pig iron. Were furnaces willing to sell for 1920 delivery there is no question but that a large tonnage would be taken, but, as mentioned in previous reports, the uncertainty respecting the future, due to possible labor disturbances and increased costs has caused producers to go very slow in booking ahead. Two producers have been out of the market for some time and the selling field is narrowed to practically two makers. One of these has advanced prices an average of 50c. per ton over the highest price of a week ago, making No. 2 X $29.50, No. 2 plain $28.50, and gray forge $28. One interest booked 10,000 tons, principally foundry grades, with a small tonnage of malleable. An inquiry for 6000 tons of foundry is noted. The strength of the market is reflected by the steady purchase of specialties, such as high silicon and high phosphorus iron, as well as in ferromanganese and magnesite and kindred commodities.

Shipments from furnaces are being handicapped to a certain extent by the poor condition of railroad cars sent to furnaces for loading. We quote as follows, f.o.b. furnace, Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon	$30.00
No. 2 X, 2.25 to 2.75 silicon	$29.00 to 29.50
No. 2 plain foundry, 1.75 to 2.25 silicon	28.00 to 28.50
Gray forge	27.50 to 28.00
Malleable, silicon not over 2.25	29.00
Basic	26.75
Basic, 1 to 1½ per cent manganese	27.25
Basic, 1½ to 2½ per cent manganese	27.75
Bessemer	30.00
Lake Superior charcoal, regular grades, f.o.b. Buffalo	34.85

Finished Iron and Steel.—Wire specifications present the feature of the week, a number of the larger mills having received heavy orders, which have put deliveries forward. Export demand is beyond what the trade can supply. Full quotas are also being specified in steel bars by customers in all instances, and the export demand is heavy. One local mill is running all departments full for the first time since the signing of the armistice. The sales agency of one of the larger producers has received instructions to withdraw from the market on all commodities except structural material and heavy plates. The prices for nuts and for spikes have been advanced. The Kellogg Structural Steel Co., Buffalo, has received a contract for 100 tons of structural steel for the Broadway Theatre, Buffalo, and for a like tonnage for plant extension for the Alberger Pump & Condenser Co., Newburgh, N. Y. The Lackawanna Bridge Co. has a contract for a small tonnage for rebuilding plant of the Buffalo Asphalt Block Co., Buffalo, destroyed by fire; and the John W. Cowper Co., Buffalo, has a contract for a power-house for Gratan & Knight, Mfg. Co., St. Louis, Mo., requiring a small tonnage. The Gorsline & Swan Construction Co., Rochester, have been awarded a contract for a foundry addition for the General Railways Signal Co., that city, requiring about 200 tons. Sales agencies report that manufacturers have adopted a new card of prices for cold-rolled finished steel and in future instead of quoting discount off from regular list this commodity will be sold at a base price, plus extras for size and also quanity differentials, the same as for soft steel bars. The new price is 3.60 base, f.o.b., Pittsburgh.

Prices f.o.b. Buffalo are as follows: Steel bars, 3.40½c.; iron bars, 4.10½c.; shapes, 3.50½c.; plates, 3.70½c.; No. 10 blue annealed sheets, 4.60½c.; No. 28 black, 5.65½c.; No. 28 galvanized sheets, 7.00½c. For "store door delivery" add 0.04½c. to each commodity.

Old Material.—The market is somewhat stronger and more active than a week ago and prices are holding firmly. The demand from local mills is better on account of the larger orders for finished products they are booking. No large tonnages of heavy melting steel, or other commodities, are being placed, however, as consumers have not acceded to dealers' demands for higher prices, and dealers have not attained the higher levels they sought to reach. Prices have remained about stationary. We quote dealers asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel, regular grades	$18.00 to $18.50
Low phosphorus, 0.04 and under	22.00 to 23.00
No. 1 railroad wrought	23.00 to 23.50
No. 1 machinery cast	24.50 to 25.50
Iron axles	26.00 to 27.00
Steel axles	26.00 to 27.00
Carwheels	22.50 to 23.50
Railroad malleable	19.00 to 20.00
Machine-shop turnings	10.00 to 12.00
Heavy axle turnings	15.00 to 16.00
Clean cast borings	13.00 to 14.00
Iron rails	23.00 to 24.00
Locomotive grate bars	19.00 to 20.00
Stove plate	21.00 to 22.00
Wrought pipe	16.00 to 17.00
No. 1 busheling	15.00 to 16.00
Bundled sheet stamping	13.00 to 14.00

Birmingham

BIRMINGHAM, Aug. 18.

No 1920 pig iron deals had been put through up to the close of last week, but the tendency to open up at a $2 differential, if that can be obtained, is strong. Water pipe and radiator works have been among the large recent buyers and stove plants and sanitary pipe shops have taken on considerable tonnage. Car shortage has affected delivery and has become a real problem. Demand for output of the steel works has increased and they are operating at near capacity. Cotton tie and steel hoop mills are especially busy. Among late acquisitions in the way of consuming steel interests is the Truscon Steel Co., which has made Birmingham its Southern headquarters and will get its shapes from the Tennessee Coal, Iron & Railroad Co. Between them the T. C. I. and Birmingham Steel Corporation are to furnish shapes for a dozen 5000-ton and eight 10,000-ton steel ships being built by their Mobile auxiliaries. Woodward Iron blew out a Woodward stack, but blew in one at Vanderbilt. Sloss-Sheffield is preparing to blow in a fourth stack. Woodstock, it is understand, is to resume in the immediate future.

Birmingham's protest of the Pittsburgh steel basing rate has been formulated and will be presented with the others. Proposed ore and coal tonnage taxes were still under debate in the Aabama General Assembly at the close of week.

Pig Iron.—Sales for the week ended Aug. 16 were not so large as in the preceding week, but the new level of $27.50 to $27.75 for foundrymen was maintained. Several inquiries for 1920 were received and are regarded in the way of feelers. Quotations made on that delivery were up $2. The silicon differentials of the interest quoting $27.50 are 1.75 to 2.25 per cent with 4, 8, 12, 16 per cent increase and so on over this base. In application to No. 3 and lower grades the first differential is 50c. and the next 25c., thus making gray forge sell at $26.75. All other interests charge the Government silicon differentials and the one interest that is selling on fracture announces itself out of the market. All interests are well cared for for the remainder of the year except on special grades with a reasonable amount of unbooked capacity by two interests for strictly fourth quarter. We quote per gross ton f.o.b. Birmingham district furnaces, as follows:

Foundry, silicon 1.75 to 2.25	$27.50
Basic	26.50

Cast Iron Pipe.—Bessemer, North Birmingham, Anniston and Chattanooga shops of the U. S. Cast Iron Pipe & Foundry Co. are in operation. The North Birmingham plant is shipping flange pipe to Charleston, Brunswick, Baton Rouge, Houston and other points. La Grange, Ga., and Williston, S. C., placed water pipe tonnages. The demand is causing an increase in operations. Sanitary shops have all they can do.

Coal and Coke.—Coal lags. Furnace coke has begun to grow scarce. Good foundry remains at $9.50 for spot and $9 on contracts with very small proportion of spot available.

Old Material.—Old material dealers are standing pat on heavy melting steel, declining to sell at present quotations, which are based on what Southern consumers are willing to pay. Yard men claim to be able to finance themselves until the consumers make better offers. An eye is cast on export business which, it is claimed, with a slight further lowering of freight rates would assume proportions. Wrought iron is barely moving at all. Small lots of heavy steel have brought prices over quotations. We quote per gross ton f.o.b. dealers' yards, prices to consumers, as follows:

Steel rails	$15.00 to $16.00
No. 1 heavy steel	14.00 to 14.50
Cast iron borings	9.00 to 10.00
Machine-shop turnings	9.00 to 10.00
Stove plate	17.00 to 18.00
No. 1 cast	22.00 to 22.50
Car wheels	22.00 to 22.50
Tramcar wheels	21.50 to 22.00
Steel axles	22.00 to 23.00
No. 1 wrought	14.00 to 15.00

St. Louis

ST. LOUIS, Aug. 18.

Pig Iron.—Buying is still confined to small quantities for third and fourth quarters, and the foundries are taking quite freely for their immediate and early needs. The advance of the Southern furnaces has not seemed to check buying only in so far as furnaces are unwilling to commit themselves. Melters, according to present indications, would buy willingly for future delivery if permitted to do so.

Coke.—Except for domestic grades buying is light, most of the metallurgical coke users being covered by contracts already made for the last half of the year. The local by-product producer is well sold ahead.

Finished Iron and Steel.—The finished product market, save for the effect of the recent railroad disturbance, is going steadily ahead in volume, mill representatives and warehouses both reporting good business. Few large contracts, however, are being considered at present. There is expectation of considerable pressure for material with the development of the fall building program, particularly in the city. For stock out of warehouse we quote as follows:

The following are present local jobbers' prices: Steel and iron bars, 3.33c. base; bands, 4.03c. base; structural shapes, 3.43c. base; plates, ¼-in. and heavier, 3.63c. base; No. 10 blue annealed sheets, 4.53c.; wire nails, $3.75 per keg base; machine bolts, smaller sizes, 50 and 5 per cent off list; larger sizes, 40 and 5 per cent. Semi-finished nuts, 9/16-in. and smaller, 75 and 10 per cent off list; soft steel rivets, 60 per cent off; wood screws, 80 and 10 per cent off, and coach screws, 50 and 10 per cent off list.

Old Material.—Dealers have not yet entirely recovered from the recent disturbance caused by the railroad situation. Prices are still rather nominal because of the lack of any deals of definite character. The larger dealers are not inclined to do much just now, while the smaller dealers are trading as little as they can to cover their short and long accounts.

Per Gross Ton

Old iron rails	$20.50 to $21.00
Old steel rails, rerolling	26.00 to 26.50
Old steel rails, less than 3 ft.	21.00 to 21.50
Relaying rails, standard sections, subject to inspection	38.00 to 40.00
Old carwheels	22.00 to 22.50
No. 1 railroad heavy melting steel	18.00 to 18.50
Heavy shoveling steel	16.00 to 16.50
Ordinary shoveling steel	15.00 to 15.50
Frogs, switches and guards, cut apart	18.00 to 18.50
Ordinary bundled sheets	9.00 to 9.50
Heavy axle and tire turnings	11.50 to 12.00

Per Net Ton

Iron axle bars	$18.50 to $19.00
Steel angle bars	16.00 to 16.50
Iron car axles	30.50 to 31.00
Steel car axles	26.50 to 27.00
Wrought arch bars and transoms	21.50 to 22.00
No. 1 railroad wrought	17.00 to 17.50
No. 2 railroad wrought	16.00 to 16.50
Railroad springs	16.50 to 17.00
Steel couplers and knuckles	15.50 to 16.00
Locomotive tires, 42 in. and over, smooth inside	18.50 to 19.00
No. 1 dealers' forge	15.00 to 15.50
Cast iron borings	8.50 to 9.00
No. 1 busheling	14.50 to 15.00
No. 1 boiler, cut to sheets and rings	13.50 to 14.00
No. 1 railroad cast	22.00 to 22.50
Stove plate and light cast	18.00 to 18.50
Railroad malleable	14.50 to 15.00
Agricultural malleable	14.50 to 15.00
Pipes and flues	14.50 to 15.00
Heavy railroad sheet and tank	13.50 to 14.00
Railroad grate bars	16.00 to 16.50
Machine shop turnings	9.00 to 9.50
Country mixed	12.00 to 12.50
Uncut railroad mixed	14.00 to 14.50
Horseshoes	18.50 to 19.00

Boston

BOSTON, Aug. 18.

Pig Iron.—Talks with foundrymen at the recent outing of the New England Foundrymen's Association at Providence indicated that considerable iron is still being purchased at shaded figures, though the amount procurable at low prices is much less than a month ago. At least three or four furnaces have advanced foundry iron 50c. a ton in the last week. Several more furnaces have withdrawn from the market. Sales of Southern iron are becoming more and more rare because of the $8 freight rate and the increased cost of Southern labor, certain desired qualities of the iron being the chief motive for its purchase in New England. A sale was made of 400 tons of malleable iron to a nearby foundry. For 1920 delivery 3000 tons of 2.75 to 3.25 silicon iron was sold at $29, furnace, immediately before the price was raised $1. As an indication of the comparison of volume of business done in New England and the New York and New Jersey district, one firm sold 1050 tons in the first district and 1700 tons in New York and New Jersey. A textile manufacturer of Central Massachuseets is inquiring for 4000 tons of silicon 2.25 to 2.75 and a Framingham, Mass., buyer is asking for 1500 tons of the

same grade. Twenty-five hundred tons of coke was sold for $9.90, though quotations for the rest of the year are now generally around $10.40, delivered New England. Prices on 1920 coke are not being quoted as yet by the makers, though it is expected they will send out figures in a few days. Prediction has been made that these figures will range from $10.90 to $12.00. We quote, delivered to New England points: Eastern Pa., No. 2 X (silicon 2.25 to 2.75) $31.90; Eastern Pa., No. 2 plain (silicon 1.75 to 2.25) $30.90; Buffalo, No. 2 X (silicon 2.25 to 2.75) $32.90; Buffalo, No. 2 plain (silicon 1.75 to 2.25) $31.90; Virginia, No. 2 X (silicon 2.25 to 2.75) $34.70; Virginia No 2 plain $33.70; Southern No. 2 foundry (silicon 2.25 to 2.75) $36.60.

Finished Steel.—A mill representative of plates, the demand for which has not been good since the armistice, recently sold for a large standpipe, for 15 boilers and for several miles of a water line. Another steel company is booked solid for the rest of the year on wire products and pipe. Another reports a good demand for blue-annealed sheets; still another tells of a keen demand for carbon steel bars among manufacturers of tools, machine shops, etc., though reports a dullness in requests for structural steel. However, for the latter the New England Structural Co. has taken the following contracts: 210 tons for the addition to the Globe Building, Washington Street, Boston; 112 tons of heavy girders for the foundation of the Star Worsted Co., Fitchburg, Mass., and 97 tons for the S. A. Wood Machine Co., South Boston. Advances in some products are expected, such as steel bars. Upon the readjustment of troubles involving railroad shopmen's strikes, which have hindered deliveries, business in all lines is expected to be active.

Old Material.—Buying has not been so great in volume, especially from Pittsburgh consumers, since their sudden active demand subsided. However, foundries are fairly active buyers. Now that many of the Worcester foundries have resumed operations after recent strikes, they are in the market again for cast scrap. Some of the local steel users have been buying certain grades of steel to make proper mixtures. Prices have not declined because of the calming down of large buying, but rather their tendency is upward. The Government's high demands for its material is having its effect in keeping the market up. For instance, on an offering of 11,000 tons of heavy melting steel the high bid was $18 a gross ton, shipping point, given by a local scrap firm, but the bid was rejected as being too low. We quote heavy melting steel from $15.50 to $16.50, considerable material having been bought by brokers and dealers at the higher figure, for instance, 150 tons for delivery to a Worcester consumer. An indication of market prices of cast scrap is given by a recent sale of 100 tons of machinery cast for $28.50 delivered to consumer, the freight being $2.10. There is a good demand for borings and turnings, but sales of rolling mill stocks, including pipe and wrought scrap, are scarce. Railroad embargoes in New England have, doubtless, slackened inquiries for immediate delivery, especially from both Pennsylvania districts, these districts turning to sellers nearer by who have not been so seriously affected. Recent high bids on scrap and semi-finished steel through the Boston ordnance office, 19 Portland Street, include the following: 366,583 lb. 2⅞-in. cold-rolled steel at the Framingham Screw Works, Framingham, Mass., by the Buffalo Bolt Co., Buffalo, for $31.72 a gross ton; 20,901 lb. steel parts for hand grenades at the Gorham Mfg. Co., Phillipsdale, R. I., by Perry, Buxton & Doane Co. for $12.84 per gross ton; 107,000 lb. malleable iron grenade bodies at the Gorham Mfg. Co. to Perry, Buxton & Doane Co., South Boston, for $17.73 a gross ton. On an offering of 11,000 tons of steel blooms at the Meade-Morrison Mfg. Co., Gloucester, Mass., the Roxbury Iron & Metal Co., Roxbury, Mass., was high bidder at $18 a gross ton, though all bids were rejected by the Government as being considered too low. On 25 tons of steel for bacon cans at Concord, N. H., the American Pulley Co., Philadelphia, bid $60 a net ton; 200 tons of adapters made from round steel screw stock, at the Worcester ordnance storage plant, Roxbury Iron & Metal Co. bidding $16.46 a gross ton, Boston; 3116 lb. music wire at the Morgan Spring Co., Worcester, Steel Sales Corporation, Chicago, bidding $300 a net ton. Dealers' buying prices, Boston, follow:

No. 1 heavy melting steel	$15.50 to $16.50
No. 1 railroad wrought	19.00 to 19.50
No. 1 yard wrought	17.00 to 17.50
Wrought pipe (1 in. in diam., over 2 ft. long)	15.00 to 15.50
Machine shop turnings	11.00 to 11.50
Cast iron borings	10.50 to 11.00
Heavy axle turnings	11.00 to 11.50
Blast furnace borings and turnings	10.00 to 10.50
Forge scrap	10.50 to 11.00
Bundled skeleton	10.50 to 11.00
Steel car axles	21.00 to 21.50
Carwheels	24.50 to 25.00
Machinery cast	25.00 to 26.00
No. 2 cast	22.00 to 23.00
Stove plate	18.50 to 19.00
Railroad malleable	17.50 to 18.00

Cincinnati

CINCINNATI, Aug. 19.

Pig Iron.—Quotations in the South vary. Some furnaces are quoting and selling some iron at $27.75, Birmingham basis, for 1.25 to 1.75 silicon. Others have fixed on $27.50 for the same iron, while one furnace that recently started operations has authorized its selling representatives to take on this year's business at the old schedule of $26.75. Quite a number of sales for fourth quarter shipment have been made in this vicinity, but as the supply of this iron is growing shorter, it is hardly probable that any will be available within a few days. All southern Ohio furnaces are now holding firm at $27.75, Ironton, but have little iron to dispose of in the remainder of the year, and practically none for spot shipment. The inability to obtain any Ohio silvery iron has caused many melters to turn to the South for a supply of high silicon iron, and they have been successful in picking up a few small lots averaging from 4 to 6 per cent silicon. Production of high silicon iron in Jackson County, Ohio, is now at a standstill, as the only remaining live furnace in that district blew out last week for repairs. Virginia furnaces have sold some iron in Cincinnati territory lately, the largest sale being one for 1000 tons for last quarter shipment. This iron brought a premium on account of its comparatively high silicon content. The car situation is fast becoming serious and iron production may be cut down soon on account of slow deliveries of coke. No books are open for next year's shipment.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, silicon, 1.75 to 2.25 (base price)	$31.10
Southern coke, silicon, 2.25 to 2.75 (No. 2 soft)	32.10
Ohio silvery, 8 per cent silicon	42.05
Southern Ohio coke, silicon, 1.75 to 2.25 (No. 2)	28.55
Basic Northern	26.55
Standard Southern carwheel	51.60
Malleable	29.05
Lake Superior charcoal	35.35

Coke.—There is an increasing demand for both furnace and foundry coke for this year's shipment. In the Connellsville district producers seem to be able to take care of all business entrusted to them, but in other fields this is not the case. Shipments from the Wise County and New River fields are running behind and the scarcity of cars is causing considerable delay in getting fuel through to destination. Connellsville 48-hr. coke is unchanged around $4.25 to $4.50 per net ton at oven and 72-hr. coke at $6 to $6.50. The nominal quotation on New River foundry coke is $8 at ovens and on Wise County and Pocahontas foundry grades from $7 to $7.50.

Finished Material.—A new card has been issued on cold-rolled shafting and it is now quoted by the pound instead of on a discount from list basis. To-day's mill

quotation is 3.60c. per lb. base Pittsburgh. The local jobbers' prices have not yet been figured out. The expected advance on wire nails has not yet developed and local jobbers are selling them at $3.75 per keg base. A better demand for structural shapes and reinforcing concrete rods is reported from all sources. Both black and galvanized sheets are firm and No. 28 black sheets are quoted at 4.35c. and galvanized at 5.70c. Pittsburgh, with a freight rate of 23c. to Cincinnati. Hoops and bands are in better demand.

The following are present local jobbers' prices: Steel and iron bars, 3.33c. base; bands, 4.03c. base; structural shapes, 3.43c. base; plates, ¼-in. and heavier, 3.63c. base; No. 10 blue annealed sheets, 4.53c.; wire nails, $3.75 per keg base; machine bolts, smaller sizes, 50 and 5 per cent off list; larger sizes, 40 and 5 per cent. Semi-finished nuts 9/16-in. and smaller, 75 and 10 per cent off list; soft steel rivets, 60 per cent off; wood screws, 80 and 10 per cent off, and coach screws, 50 and 10 per cent off list.

High Speed Steel.—Standard brands are unchanged at $1.50 per lb., but a few makers have been quietly taking business as low as $1.35. Business is only fairly good and purchases still continue to be for small quantities.

Fluorspar.—A little better demand has developed. Shipments on former contracts are moving somewhat slowly on account of the growing shortage of cars. Washed gravel fluorspar is quoted at $25 per ton at point of shipment.

Old Material.—The strike at the Andrews Steel Co.'s plant in Newport, Ky., has closed an outlet for a large tonnage of scrap. Trouble is also reported in getting rolling stock in which to load metal for outside consumers. Prices are again somewhat weak and have been reduced on an average of about 50c. a ton. There is a good demand for cast borings, but steel turnings are not wanted. The following are dealers' buying prices f.o.b. at yards, in carload lots, Southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet	$12.00 to $12.50
Old iron rails	22.50 to 23.00
Relaying rails, 50 lb. and up	40.00 to 41.00
Rerolling steel rails	21.00 to 21.50
Heavy melting steel	17.00 to 17.50
Steel rails for melting	17.00 to 17.50
Old carwheels	18.50 to 19.00
No. 1 railroad wrought	18.00 to 18.50
Per Net Ton	
Cast borings	$8.00 to $8.50
Steel turnings	7.00 to 7.25
Railroad cast	20.00 to 20.50
No. 1 machinery	22.00 to 22.50
Burnt scrap	13.00 to 14.00
Iron axles	24.50 to 25.00
Locomotive tires (smooth inside)	18.00 to 18.50
Pipes and flues	13.50 to 14.00
Malleable cast	16.00 to 16.50
Railroad tank and sheet	12.00 to 12.50

Cleveland

CLEVELAND, Aug. 19.

There is a strong and growing sentiment in this district in opposition to increases in prices of pig iron or finished materials. While it is generally recognized that advances would be justified, owing to the probable increase in costs of raw materials, freights and wages, many sellers are firm in the conviction that it would be both unpatriotic and harmful to business in the long run to allow prices to ascend rapidly, and it is believed that it would be better not to advance them at all. The only question is whether under the pressure of buying it will be possible to keep prices down. Some companies, especially those manufacturing wire and sheets, are withdrawing from the market rather than follow the old time policy of advancing prices in order to check buying.

The labor situation in Cleveland and at the head of the Lakes shows distinct improvement, although not yet entirely satisfactory. The strike of employees of the Newburgh & South Shore Railroad, which takes the hot metal from the blast furnaces to the steel plants and the ore from the ore piles to the blast furnaces, has been ended by the taking back of the discharged train conductor who had abandoned his train under duress from the union. Demands for recognition of the union and higher wages were withdrawn. Following resumption of work on the railroad, operations have been resumed at the Emma blast furnace and also at about 75 per cent of the capacity of the steel plants and rolling mills of the American Steel & Wire Co. Owing to blast furnace employees at the Central plant still being on strike, the four Central blast furnaces are still idle. With the help of the product of Emma furnace and pig iron on hand, the open hearth departments will be able to operate for a time, but it may be necessary if the strike continues to bring pig iron from Pittsburgh or elsewhere.

Some of the dock laborers at the head of the Lakes have returned to work, and the docks at the Northern Pacific and Soo Line at Superior are in operation. At Duluth, Two Harbors and one dock at Superior ore is being loaded into dock, but no ore is being shipped. The docks at Escanaba, Marquette and Ashland are idle, and the strikers are meeting to-night to decide whether or not they will return to work.

Iron Ore.—E. D. Brigham, manager of the head of the lakes district for the United States Railroad Administration, last Friday notified the dock workers at upper Lake ports, who were on a strike, that they must return to work Monday, Aug. 18, and that their demand for a 30 per cent increase in wages would then receive consideration. He added that if the men did not return to work when the docks were opened Monday, the docks would be closed indefinitely. The notice had the desired effect to a limited extent and some of the men returned to work. Several vessels were loaded Monday, and it is expected that many more will leave within a day or two. It is estimated that the decrease in ore shipments for the month due to the strike will amount to about 5 000,000 tons, but this is not considered a serious matter. During the past 10 days attention has been concentrated on the strike, and there has been very little selling of ore. Ore prices delivered f.o.b., lower Lake ports, are as follows:

Old range Bessemer, $6.45; old range non-Bessemer, $5.70; Mesaba Bessemer, $6.20; Mesaba non-Bessemer, $5.55.

Pig Iron.—Struthers Furnace Co., Struthers, Ohio, has decided to blow in its stack this week on foundry iron, and a considerable amount of the product which it expects to make during the next few months has been sold. New life has come to the basic pig iron market through an inquiry for 10,000 tons from the American Steel Foundries for delivery this year at the Alliance, Ohio, plant, but reports continue to be heard of low prices on basic. It is probable that the business which has just appeared will be placed at less than the regular quotation of $25.75, Valley. The foundry iron market is extremely strong, and although no large transactions are reported, there have been many sales running from a carload to a few hundred tons. No sales of Southern iron in this territory are reported. We quote, delivered Cleveland, as follows:

Bessemer	$29.35
Basic	25.65
Northern No. 2 foundry, silicon, 1.75 to 2.25	27.65
Southern foundry, silicon, 2.25 to 2.75	33.00
Gray forge	26.15
Ohio silvery, silicon, 8 per cent	44.65
Standard low phos., Valley furnace	$38.00 to 40.00

Finished Material.—The ending of the strike on the Newburgh & South Shore Railroad, resulting in nearly all of the finishing capacity of the American Steel & Wire Co. resuming operation, has enabled the company to book a considerable number of orders which had been piling up, but the deliveries will be somewhat delayed. Some manufacturers of steel bars have made an agreement with agricultural implement manufacturers by which contracts will be made for the first quarter of 1920, the price to be that prevailing Jan. 1, 1920. Other companies have declined to make this agreement. The 600 tons of structural material required for the new Studebaker factory building in Detroit will be about equally divided between Bethlehem sections and standard shapes. Competition on structural contracts in Cleveland during the past few months has been keen.

The steel for the Cowell & Hubbard building was contracted for at about $66 per ton delivered, and two months later the steel for the Hanna building went at about $76; while $80 for ordinary construction is now about the price. The cost of erection is about $20 per ton additional.

The Fort Pitt Bridge Works has taken a contract for 275 tons for the plant at Rock Hill, S. C., of the Anderson Motor Co., Detroit, and 63 tons for the Dunham Co.'s foundry, Berea, Ohio. The sheet market is very strong, and the practice of quoting blue annealed sheets Nos. 10 and 12 gage on the plate basis is rapidly disappearing. A leading manufacturer of wire, which has not advanced its prices, is entirely out of the market.

Warehouse Business.—Some of the small jobbers in other cities are writing to Cleveland jobbers to inquire whether warehouse prices are to be advanced. As Eastern jobbers charge the Pittsburgh price plus freight plus 1c. per lb. and Cleveland jobbers are charging the Pittsburgh price plus freight plus ¾c. per lb., it is believed that an advance in this district is justifiable. The Cleveland jobbers have, however, replied to the letters, saying that they do not expect to advance prices in the near future. Warehouse prices are as follows:

Steel bars, 3.27c.; plates, 3.57c.; structural shapes, 3.37c.; bands and hoops, 3.97c.; No. 10 blue annealed sheets, 4.47c.; No. 28 black sheets, 5.27c.; No. 28 galvanized sheets, 6.62c.

Bolts, Nuts and Rivets.—There is some criticism of the recent advance in the price of $4 per ton on rivets. It is pointed out that with steel bars selling at 2.35c., Pittsburgh, the new price makes an unusually large spread beween bars and rivets. A meeting of bolt and nut manufacturers will be held Aug. 20, at which the investigation of the Pittsburgh basing point by the Federal Trade Commission will be considered, and it will be decided whether the nut and bolt interests will take any part in the hearing.

Coke.—The market for prompt foundry coke is much stronger and from $6 to $6.50 is being asked, while on contract the usual quotation is $5.25 to $5.50 up to Jan. 1.

Old Material.—Mills are staying out of the market, and dealers are not as willing to take on additional tonnages as they were two or three weeks ago. The market continues in a very dull condition, with prices unsteady. Heavy melting steel and two or three other products have been marked down from 25c. to $1. Shell steel being sold by the Government is classified as heavy melting steel, as it is too high in phosphorus to be ranked as low phosphorus. The last sale of low phosphorus made in this territory was 4000 tons about ten days ago. We quote per gross ton delivered consumers' yards in Cleveland and vicinity, as follows:

Heavy melting steel	$20.25 to $20.75
Steel rails, under 3 ft	23.00 to 23.50
Steel rails, rerolling	26.50 to 27.50
Iron rails	26.00 to 27.00
Iron car axles	35.00 to 36.00
Steel car axles	33.00 to 34.00
Low phosphorus melting scrap	22.50 to 23.00
Cast borings	14.25 to 14.75
Iron and steel turnings and drillings	11.50 to 12.00
Compressed steel	18.00 to 18.25
No. 1 railroad wrought	23.50 to 24.50
Cast iron carwheels	22.50 to 23.00
Agricultural malleable	18.00 to 18.50
Railroad malleable	21.00 to 22.00
Steel axle turnings	17.00 to 17.50
Light bundled sheet scrap	16.00 to 16.25
No. 1 cast	23.00 to 24.00
No. 1 busheling	19.50 to 20.00
Drop forge flashings, 10 in. and under	18.25 to 18.75
Drop forge flashings, over 10 in.	15.50 to 16.00
Railroad grate bars	19.00 to 20.00
Stove plate	19.00 to 20.00

The storage house adjoining the main building of the Cleveland Twist Drill Co., Cleveland, was destroyed by fire last week. The loss was $35,000. The storage house contained 10 drop forges valued at $30,000.

San Francisco

SAN FRANCISCO, Aug. 12.

Fearing a return to the old competitive system of shipbuilding under the handicap of prohibitive freight rates, the eighteen steel shipyards of the Pacific Coast have merged their interests into the Pacific Coast Shipbuilders' Traffic Association. This association is organized to secure lower freight rates from the East on steel so that the Pacific Coast yards can meet the competition of the Orient, which enjoys a lower freight rate on steel than the Coast yards. Every shipyard from Seattle to Los Angeles has joined the association.

Negotiations over the wage scale for the shipyards are still in progress. An effort is now being made to reach a compromise agreement. The threatened railroad strike is already affecting the supply of different iron and steel materials on the Coast. Shipments were slow before the Eastern embargoes were placed and if the present situation is maintained any length of time it will seriously affect the local trade. The jobbers already are complaining that their stocks are running low, and this is occurring in the face of increased demands for practically all materials except plates. The jobbers regard the present market as an excellent one. Some of the manufacturers have advanced the price of nails and the jobbers have followed suit by increasing the price 25 cents a keg to $5.25.

Bars.—Bars are steady and in really excellent demand. The Pacific Coast Steel Co., San Francisco., which shut down its furnaces about a month with the announced intention of not reopening before Sept. 1, is now preparing to resume operation at as early a date as possible.

Structural Steel.—Building operation is showing a steady increase in this commodity. It is already reported to be lively in the southern part of the State and it is generally expected that it will sweep through this section and on up the coast to Seattle. For this reason the future demand for structural material is expected to show a large increase.

Sheets.—Galvanized sheets continue to be in good demand in the interior of the State, although the sale in the vicinity of San Francisco is light at the present time.

Plates.—The plate situation shows no change.

Wrought Steel Pipe.—Deliveries of steel pipe are falling behind every week. The demand for line pipes is far in excess of deliveries. This is said to be due to the excess of the demand which has developed in the Texas oil fields. In the central part of the State there has arisen a demand for gas pipe which at present cannot be met. Water companies are coming into the field much more freely than they have for over a year. Both the gas and water corporations are evidently convinced that there will be no immediate reductions in the price of pipe and their orders are piling up in excess of deliveries for several months to come.

Cast Iron Pipe.—The price of cast iron pipe shows an increase of $2 this week, making the basic quotation $49. Portland recently bought 500 tons of 6, 8 and 12-in. pipe, and Los Angeles is in the market for 400 tons of 12 in. The Hetch Hetchi dam, which will store water for the new San Francisco water supply, is to be built immediately, and this will mean the purchase of a considerable supply of pipe. Contract for the dam was let this week to the Utah Construction Co. for $4,500,000. The dam will be concrete, but a good deal of steel and iron in various materials will be utilized in its building.

Old Material.—The resumption of work at the Pacific Steel Co. Works means that that corporation will again be in the field for scrap. In the meantime scrap continues to go forward to China, where it is being fabricated into bars and shapes for use in the vessels that are being built in that country for the Shipping Board. The price was not changed this week, sales being reported at $16.50 to $17 per net ton for ordinary steel melting scrap. The Southern Pacific has just issued a call for bids for 4800 tons of miscellaneous scrap. As a usual thing this scrap is bought for shipment to the Orient, and little of it is likely to reach the local mills.

New York

NEW YORK, Aug. 19.

Pig Iron.—A considerable amount of activity is reported by some sellers, while others have had less inquiry than in recent weeks. A good many foundries are asking for iron for next year, and a larger proportion of the sales being made are for that delivery than was the case ten days ago. Little has been done on the export inquiries reported from so many quarters last week and the market is attaching less importance to reports that this or that country is likely to buy. England has just bought 700 tons of basic and is inquiring for 7000 tons, while a new French inquiry is for 1000 tons of Bessemer iron. Only a small fraction of such inquiry results in business. The maintenance of prices above the so-called official level is a feature of the market that is still a matter of comment. An Eastern Pennsylvania steel interest that is a seller of foundry iron has obtained $1 a ton advance upon the standard price on much of its iron sold recently and is disposed to sell but little for delivery in 1920. Buffalo furnaces have been asking rather firmly a price of $29 at furnace on 2.25 to 2.75 per cent silicon iron. A like price has been realized on some recent sales of Virginia iron. There are indications that some recent efforts to buy round lots of foundry iron have been of a speculative character, though the inquiries came from important consuming interests, chiefly in New England. Furnaces have not been willing to sell in such circumstances. A new foundry inquiry is for 5000 tons. A good many sales have been made in the past week of several hundred ton lots and some foundries are evidently running down their stocks. Higher silicon irons have brought good prices, one sale of 2.75 to 3.25 silicon iron being reported at $32 furnace. Virginia silvery iron is scarce and as high as $35 at furnace has been paid. We quote tidewater delivery as follows:

No. 1 foundry, silicon, 2.75 to 3.25	$30.80 to $32.80
No. 2 X, silicon, 2.25 to 2.75	30.30 to 31.80
No. 2 plain, silicon, 1.75 to 2.25	29.80 to 30.80
No. 2 X, Virginia, silicon, 2.25 to 2.75	32.40 to 35.40

Ferroalloys.—The market for ferromanganese is very quiet and demand is limited to small or carload lots for early delivery. Quotations are mixed, even those for the British alloy being at variance. One representative of British makers is offering the alloy at $100, seaboard, while another has about 1000 tons available for last quarter delivery at $105. The quotation of American producers seems to be nominal at $110 to $115, delivered, but as the British product seems to dominate the situation at present, it is probable these quotations would be revised on desirable business. From 500 to 1000 tons has been sold in the last week or so. The spiegeleisen market is dull, with quotations firm at $35, furnace, for 20 per cent alloy, some makers asking more. There have been some sales for export. Ferrosilicon, 50 per cent, has been advanced by one seller to $100 per ton, delivered. The former quotation was $80 to $90. The market is quiet.

Finished Iron and Steel.—The chief item of interest is the issuing of a new classification for cold-rolled and cold-drawn steel adopted by a number of manufacturers of Aug. 18 and reviewed at length elsewhere in this issue. The net result appears to be in the case of rounds, for example, a reduction for the smaller sizes and a slight increase for the larger. The volume of inquiry in practically all lines save plates is keeping up and more is heard of mills being unable to entertain business, in most cases because of filled order books but also, notably in the case of one large mill, because of high costs, this mill refusing large lots of billets, for example, unless it could obtain $3 or $4 above the generally recognized market. The betterment in activity in fabricated steel work shown by the report that bookings of the structural shops in July amounted to 74 per cent of capacity, is emphasized by a long list of definite propositions which spell tonnage in the aggregate if not in the individual items. New work includes:

Addition of 13 stories on the railroad mail service building of the New York Central Terminal area, 3000 to 4000 tons, bids receivable Aug. 30.

Office building, Broad Street, Post & Flagg architects, 200 tons.

Hangars at Lakehurst, N. J., 9500 tons, bids to be received Sept. 8, those already received being rejected and a re-advertisement being made based on a design saving 1500 tons of steel.

Bridge for the Pennsylvania Railroad, Newark, 500 tons.

Building for Bryant Electric Co., Bridgeport, Conn., 300 tons.

Linnard Hotel, Park Avenue, New York, 4000 tons, Thompson-Starrett Co., general contractors.

Germania Mills, Holyoke, Mass., 400 tons.

Hotel Stacey-Trenton, Trenton, N. J., 400 tons.

Boat and general storage building, Bureau of Yards and Docks, Philadelphia, 1100 tons, bids to be taken Aug. 20.

Eclipse Stove Co., Rockford, Ill., 700 tons.

Bidding is showing still quite a divergence in the prices for fabrication, extreme differences of $16 per ton being noted. No award has yet been made in the case of the Allegheny River bridge for the Baltimore & Ohio, 5500 tons. Awards of the week include:

Warner Sugar Refinery Co., Edgewater, N. J., 1000 tons, to Post & McCord, fabrication by the American Bridge Co.

Pennsylvania Sugar Refinery Co., Philadelphia, 1400 tons, to the American Bridge Co.

Concentrator for Phelps, Dodge & Co., Bisbee, Ariz., 1500 tons.

New York Central, five bridges, 300 tons, to the American Bridge Co.

Texas Co., Port Arthur, 1900 tons, to Kenwood Bridge Co.

National Biscuit Co., New York, 400 tons, to the Hay Foundry & Iron Works.

Kerr Steamship Co., office building, Beaver Street, 800 tons, to the Hay Foundry & Iron Works.

Group of six buildings, Staten Island, 400 tons, to American Bridge Co.

Transfer bridge, Lehigh Valley, 750 tons, to American Bridge Co.

We quote as follows for mill shipments: Bar iron, refined grade, 2.77c.; double refined bar iron, 3.77c.; soft steel bars, 2.62c.; shapes, 2.72c.; plates, 2.92c.; all New York.

Old Material.—The market shows decided weakness in all grades but cast scrap and stove plate, which are holding to previous levels. Pittsburgh mills have stopped buying and Eastern Pennsylvania mills have apparently not started buying. In order to consummate sales, discounts have to be made generally. Most of the buying is to fulfill tonnages on old orders. The threatened strikes at the steel plants are the reasons ascribed for the dullness of the market. Borings and turnings still continue fairly active. Scrap men are watching with interest the increasing costs of pig iron and the attendant difficulty of securing it, believing that these factors will tend to boost the price of scrap. The New York district ordnance office reports the following sales of miscellaneous steel scrap: 50,000 lb. at $12.50 a ton to Louis & Max Smith, Brooklyn, N. Y., and 44,962 lb. at $15.50 a ton to T. A. Hennessy, Brooklyn, N. Y. Dealers' and brokers' buying prices, New York, follow:

Old steel rails (or equivalent)	$15.50 to $16.00
Heavy melting steel	14.50 to 15.50
Rerolling rails	21.00 to 22.00
Relaying rails, nominal	41.00 to 42.00
Steel car axles	26.00 to 27.00
Iron car axles	32.00 to 33.00
No. 1 railroad wrought	23.00 to 23.50
Wrought iron track	17.00 to 18.00
Forge fire	10.50 to 11.00
No. 1 yard wrought, long	18.50 to 19.00
Light iron	6.00 to 7.00
Cast borings (clean)	11.00 to 11.50
Machine shop turnings	10.50 to 11.00
Mixed borings and turnings	9.50 to 10.00
Iron and steel pipe (1 in. min. diam., not under 2 ft. long)	16.00 to 16.50
Stove plate	17.50 to 18.00
Locomotive grate bars	17.50 to 18.00
Malleable cast (railroad)	15.00 to 16.00
Old car wheels	21.50 to 22.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery casts	$24.50 to $25.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	23.00 to 23.50
No. 1 heavy cast, not cupola size	17.00 to 17.50
No. 2 cast (radiators, cast boilers, etc.)	17.50 to 18.00

Cast Iron Pipe.—Makers in the East have now apparently agreed to advance their quotations $2 per ton, being in this respect a little over a week behind Western makers. They have also increased the spread for class A and gas pipe to $2, as was done in the West. Prices now appear to work back to about $50 to $52 at the pipe foundries, and we quote 6-in. and heavier, $53 to $54.30; 4-in., $56 to $57.30; 3-in., $63 to $64.30, and $2 additional for class A and gas pipe.

Pittsburgh and Nearby Districts

The plants of the Pittsburgh Steel Products Co. at Monessen, Pa., and at Allenport, Pa., were shut down last week indefinitely. The management announced shortage of orders as the reason. The company manufactures seamless steel tubes. Some of the employees of the company were recently organized into a union by the Amalgamated Association of Iron, Steel & Tin Workers.

The Wilkes Rolling Mill Co., Sharon, Pa., is planning additions to double its sheet mill capacity, necessitated by largely increased business.

The housing facilities at Wilmerding, Pa., the home of the Westinghouse Air Brake Co.'s works, are to be extended by the erection of a number of new dwellings. The Westinghouse Air Brake Home Building Co., with a capital of $1,000,000, owns over 400 houses and considerable vacant property in the borough of Wilmerding and the adjacent territory. The officials of the new organization are A. L. Humphrey, chairman of the board of directors; C. A. Rowan, president; W. S. Bartholomew, vice-president, and H. C. Tener, secretary. Since the Westinghouse Air Brake Co. built its first houses for employees in 1890 there has been no increase in rents and the new company will carry out the same policy.

The Carnegie Steel Co. last week successfully tried out on the Allegheny River at Pittsburgh a new motor tug, motive power for which is furnished by benzol, which the steel company produces in large quantities in connection with its by-product coke plants. The tug will be used for hauling coal-laden barges. If further operation proves the practicability of this type of tug others will be built.

The Carnegie Steel Co. is building a steel reservoir at Clairton, Pa., to store about 300,000 tons of coal. This fuel will be used as a reserve supply for the by-product coke ovens in case the river should become icebound.

Notes from Youngstown

YOUNGSTOWN, Aug. 19.—Plant schedules in the Youngstown, Ohio, district are near 100 per cent this week, leading producers announce. Two units of the Brown-Bonnell works, Republic Iron & Steel Co., the 12 and 20-in. mills, which have been idle for several weeks, resumed Aug. 18. With blowing in of the Struthers furnace, operated at Struthers, Mahoning county, by the Struthers Furnace Co., only three stacks will be idle in the Mahoning Valley out of 25: Hannah furnace of Republic Iron & Steel Co., Grace of Brier Hill Steel Co. and the Niles stack of the Carnegie Steel Co. The Republic company has two idle furnaces in the Shenango valley, Atlantic at New Castle, Pa., and Hall at Sharon, Pa. The McKeefrey furnace at Leetonia, 20 miles south of Youngstown, which suspended early in the year, is still idle.

With a payroll of $6,870,519 for July in Youngstown, Ohio, total wage distribution first seven months of 1919 is about $5,000,000 ahead of the same period in 1918, respective totals in the two years being $49,312,210 and $44,696,719. The 1918 wage disbursement was $84,393,688.

Because of the heavy demand from the oil country for pipe it is reported one district producer is planning additional pipe mill extensions to involve expenditure of over $1,000,000.

British Situation Improves

America Sells Tin Plate—German Inquiries and Prices—Belgian Sales—Mission to John Hodge

(*By Cable*)

LONDON, ENGLAND, Aug. 18.

Yorkshire miners have returned to work, the Sheffield steel works are opening, the strike of the Tees engineers has ended and there is a steady demand for pig iron. Weather conditions are affecting adversely the Welsh steel output and it is very difficult to buy steel plates. All sorts of prices are asked.

American bar iron is obtainable at £18 10s., c.i.f. American skelp is offered freely and sales are reported. Tin plates are strong; 300,000 boxes of oil size plates have been divided between Wales and the United States. The Welsh price was at about a 34s. basis, f.o.b.

There are good German inquiries, but some mills are filled up for December and January. Black sheets are strong, with close annealed No. 24 gage at £24, and 107-lb. Japan specifications, £29. Belgian shingles have sold for India at £24 c.i.f. Bombay. Galvanized sheets are firm. The Upper Forest and Grovesend plants are restarting. The price is £28 10s. and upward.

Ship plates are £19 15s. and upward; round bars ⅝ to 3 in. £20; boiler plates £21 15s. and tin plates 35s. 6d. base.

No. 2 Belgian iron bars have sold at £16 10s. basis, f.o.b. Belgian exports in June have amounted to 150 tons of pig iron, 144 tons of sheets, 3037 tons of merchant bars and 131 tons of nails.

The actual prices of German products are as follows: Hematite, 563 m. ($28.85 per metric ton of 2204 lb. with marks at 5⅛c.); Siegeland iron, 465 m. ($23.85); German foundry, 517 m. ($26.50); spiegeleisen, 502 m. ($25.75); Luxemburg iron, 442 m. ($22.65); steel billets, 625 m. ($32); sheet bars, 630 m. ($32.30); rods, 745 m. ($38.20; thick sheets, 835 m. (42.80); thin sheets, 985 m. ($50.50).

The executives of the Iron and Steel Trades Confederation are sending John Hodge, M. P., to the United States to investigate working conditions.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalents figured at $4.24 for £1, with the reservation that most makers have temporarily withdrawn prices:

	£ s. d.	£ s. d.		
Pig Iron				
East coast hematite	10 5 0	.....	$43.46	.....
West coast hematite	10 5 0	.....	43.46	.....
Scottish foundry	10 10 0	.....	44.52	.....
Billets	15 0 0	.....	63.60	.....
Tin plate and sheet bars	14 0 0	.....	59.36	.....
Rails, 60 lb. and upward	16 10 0	.....	69.96	.....
			Cents per lb.	
Bars, ⅝ to 3 in.	20 0 0	.....	3.79	.....
Beams	17 10 0	.....	3.31	.....
Plates	18 5 0	.....	3.45	.....
Plates, ship	19 15 0	.....	3.74	.....
Plates, boiler	21 15 0	.....	4.12	.....
Bar iron, stand. crown	22 0 0	.....	4.16	.....
Galvanized sheets	28 10 0	.....	5.40	.....
Tin plates, 14 x 20, coke, 112 sheets, 108 lb., f.o.b. Wales	1 15 6	.....	$7.54	.....

Many Steel Plants Closed—Finished Steel and Tin-Plate Bars Higher

LONDON, ENGLAND, Aug. 1.—The main topic of conversation here is, of course, the extraordinary situation brought about by the government increase in the price of coal of 6s. per ton and of the miners' action in connection therewith. This advance is wholly unjustified by conditions and it is equally apparent that the whole thing is a poltical dodge to discredit the nationalization proposals which have been before the coun-

try. Government control and the perpetuation of what were believed to be merely temporary measures for the successful carrying on of the war have aroused resentment from one end of the country to the other. However, business people are inarticulate.

Steel works in all parts of the country have been partially stopped and some of them have closed altogether. Sheffield and district have, of course, been hit hard and the industrial position in this country appears indeed to be in the melting pot.

Pig-iron prices have not been advanced as a result of the advance in coal, the blast-furnace owners having apparently anticipated the upward movement when making their last advance of 20s. a ton. Already prices are so high here that it pays many consumers to import material from America, and any other advance would have only been bringing about further disaster. The furnaces are working very badly, labor is intractable, costs preposterous and shipping conditions going from bad to worse. All our ports are congested, there is no room on the wharves to discharge ships, vessels cannot get into dock, but the subsidizing of idleness continues in full force.

In finished iron and steel there have been some advances declared but no one really seems to know what they are. There is a vague sort of belief that makers are requiring about 30s. a ton advance for plates, but all the quotations available indicate no alteration so far. The fact is works do not want to quote at all and it would not be surprising if the accumulated difficulties with which the managements are faced did not before long cause the closing down of big establishments.

Tin-plate bars went up to £14 a few days ago and the Welsh people are paying this price freely now for deliveries over the rest of the year. Tin-plate prices of course have gone up and as much as 34s. 6d. to 34s. 9d. has been paid for IC, 20 x 14. f.o.b. Galvanized sheets also are advancing and as much as £28 5s. has been paid f.o.b. for 24g. in bundles. Japan is a confident buyer of everything available.

Export Trade

Among recent sales on account of export are 20,000 tons of tin plate for Japan, 240 tons of wrought pipe for Spain, 1000 tons of iron and steel bars, 500 tons of wrought pipe and 500 tons of hoops, all for England; several lots, 1000 boxes each, of tin plate for Japan and China, several lots of 100 tons of bars and some of 1000 keg lots of nails for India. South America has been buying heavily in barbed wire and galvanized sheets. An unusual inquiry is that for crop ends of ingots, billets, rods, shapes, galvanized cables, etc., from China. For the Chinese Government the American Car & Foundry Co. has booked 100 flat cars.

Conspicuous among the inquiries are those for tin plate for Japan from several sources in that country.

Heavy British Shipbuilding

WASHINGTON, Aug. 19.—Trade Commissioner Leonard B. Gary reports from London under date of July 14 that British shipbuilding yards are booked ahead with orders for some months. One large firm in London, which has orders for five cargo ships and one passenger liner, has been unable to place them. Replies from more than ten yards advised this firm that they cannot consider these orders until after next fall. One of the reasons for this, according to a member of the firm, is that British shipyards have booked large orders for Norwegian interests. One shipbuilding yard alone has orders for more than 35 Norwegian steamships.

To Consider National Unrest

A conference to consider the existing situation of national unrest, with a view of formulating a concensus of opinion, has been called by the Illinois Manufacturers' Association, 76 West Monroe Street, Chicago. It will be held at the Congress Hotel, Chicago, Sept. 8-9. Committees will present the conclusions reached to Congress and others concerned.

IRON AND INDUSTRIAL STOCKS

Lower Trend of Market Quotations Results From Labor Unrest — Professional Trading Prominent

NEW YORK, Aug. 18.

The market the past week has been largely dominated by professional trading, and reactions have alternated with advances. For the first time since last spring Steel common sold below par and other steel company issues were correspondingly low. The largest factor making for lower prices has been the general labor unrest with particular reference to an extended strike in the steel industry. The imminence of the Senatorial conference with the President regarding the peace treaty has restricted trading.

The range of prices on active iron and industrial stocks, from Tuesday of last week to Wednesday of this week, was as follows:

Allis-Chalm. com.	35½ - 38	Int. Har. pf.	— -117¾
Allis-Chalm. pf.	90¾ - 93	Lackaw. Steel	76 - 82
Am. Can com.	47½ - 53⅝	Lake Sup. Corp.	22¼ - 24¾
Am. Can pf.	104 -104¾	Lima Loco.	— - 85
Am. Car & F. cm.	120 -131¾	Midvale Steel	48 - 52¾
Am. Car & F. pf.	115½-116	Nat.-Acme	35⅜ - 38½
Am. Loco. com.	81½ - 93⅝	Nat. E. & St. cm.	69⅝ - 74⅞
Am. Loco pf.	105⅝-106	N. Y. Air Brake.	111½-119
Am. Ship com.	— -126	Nova Scotia Stl.	70½ - 82
Am. Ship pf.	— - 88	Pittsb. Steel pf.	92¼ - 95
Am. Stl. Fds. cm.	37⅝ - 43⅜	Pressed Stl. com.	80 - 92
Am. Stl. Fds. pf.	94½ - 96½	Pressed Stl. pf.	— 103
Bald. Loco. com.	100¼-116	Ry. Stl. Spg. cm.	86 - 95
Beth. Stl. Cl. B.	79½ - 88⅝	Republic com.	82½ - 90⅜
Case, J. I., pf.	— -101	Republic pf.	104⅝-104¾
Cent. Fdry. com.	29 - 38	Sloss, com.	60¼ - 65½
Cent. Fdry. pf.	56 - 70	Superior Steel	35¼ - 40⅞
Chic. Pneu. Tool.	75 - 77	Sup. Steel, 1st pf.	— -105
Colo. Fuel	40¼ - 45⅜	Transue-Williams	55⅜ - 59
Cru. Steel com.	132¼-141⅜	Un. Alloy Steel.	50 - 53⅜
Cru. Steel pf.	100 -100¼	U. S. Pipe com.	29½ - 37
Gen. Electric	162 -165	U. S. Pipe pf.	65⅛ - 67
Gt. No. Ore. Cert.	37⅜ - 44½	U. S. Steel com.	99½-105⅝
Gulf States Steel.	58 - 60⅜	U. S. Steel pf.	115 -116¼
Harb.-W. Ref. pf.	— -102½	Va. I. C. & Coke.	— - 61
Int. Har. com.	128¼-131	Westing. Elec.	51 - 53¾

Dividends

The American Locomotive Co., quarterly, 1½ per cent on the common and 1¾ per cent on the preferred, payable Sept. 30.

The Canadian Car & Foundry Co., quarterly, 1¾ per cent and extra 1¾ per cent on account of accumulated dividends on the preferred, payable Oct. 10.

The Steel Products Co., quarterly, 1¾ per cent on the preferred, payable Sept. 1.

Seaboard Steel & Manganese Receivership

Stanton S. Freeman, New York, has been appointed receiver of the Seaboard Steel & Manganese Corporation, 50 East Forty-second Street, New York, by Federal Judge John C. Knox on the application of Philip E. Wright and other creditors. The company has two blast furnaces at Temple, Pa., which, it is asserted, have not been operated for several months, so that the book value of the corporation is said to have declined from $1,720,694 on Jan. 1 to $950,000 at the present time. William R. Hopkins, president, has concurred in the application for the receiver.

Iron and Steel Freights to Far East

WASHINGTON, Aug. 20.—The Shipping Board has announced a rate of 90c. per 100 lb. or 50c. per cubic foot, ship's option, from United States North Atlantic ports to French Indo-China, Malay States and Dutch East Indies on band iron, hoop iron, bars, billets, beams, blooms, pig iron, plates, structural steel, barb wire, plain and galvanized wire, trolley poles, boiler tubes, bridge material, spelter, car wheels, tees, angles, channels, bolts, nuts, steel ingots, rods, sheets, slabs, rails and accessories, staples, shafting, tin plate, horse shoes and nails, concrete reinforcement, castings and axles.

Plans for Congress of the Safety Council

The eighth annual congress of the National Safety Council will be held at Cleveland, Oct. 1 to 4. There will be four general sessions, four round tables, and 35 sectional meetings. All general sessions will open at 2 p. m., and the sectional meetings at 9.30 a. m. There will be three meetings each of the metals, mining and steam railway sections, one meeting each of the marine and navigation and textiles, and two meetings of each of the following sections: Automotive, cement, chemical, construction, electric railway, health service, packers, paper and pulp, public safety, public utilities, rubber, wood-working, and women in industry.

The first general session will be devoted entirely to a discussion of employees representation under the following sub-heads: "Co-operation and Industrial Progress," "Labor Management and Collective Bargaining," "Practical Aspects of Employees' Representation" and Employees' Representation from the Standpoint of Organized Labor."

The report of the nominating committee of the National Safety Council, submitted to the secretary of the council on Aug. 1, shows the following nominations for election, at the next annual meeting, as directors to succeed the directors whose terms of office expire this year:

L. H. Burnett, assistant president, Carnegie Steel Company, Pittsburgh; C. L. Close, manager bureau of safety, sanitation and welfare, United States Steel Corporation, New York; Robert F. Coleman, director of personnel, Pierce Arrow Motor Car Co., Buffalo; Dr. Otto P. Geier, manager, employees service department Cincinnati Milling Machine Co., Cincinnati; Arthur T. Morey, general manager Commonwealth Steel Co., Granite City, Ill.; B. W. Nutt, Strong, Kennard & Nutt Co., Cleveland; Francis P. Sinn, assistant to vice-president, New Jersey Zinc Co., New York; Phillip Stremmel, National Enameling & Stamping Co., Granite City, Ill.; Stephen W. Tener, manager, accident and pension department, American Steel & Wire Co., Cleveland; J. M. Woltz, safety director Youngstown Sheet & Tube Co., Youngstown, Ohio.

Nineteen of this list are nominated for re-election and the following are new nominees; Mr. Burnett, Mr. Coleman, Mr. Nutt, and Mr. Stremmel. The directorate of the National Safety Council includes 75 persons, 25 of whom are chosen each year.

Government Ship Owning Policy

WASHINGTON, Aug. 19.—John Barton Payne, the new chairman of the United States Shipping Board, in his first interview after assuming office, outlined his policy with respect to the sale of ships and indicated his intention of following the lines laid down by his predecessor, E. N. Hurley.

"What we need," said Mr. Payne, "is the establishment of a permanent merchant marine. The Government finds itself, as a result of the war, the owner of a very large number of ships. The question of whether the ships should be sold or can be sold should first be determined by the President and by Congress, before any definite policy is announced. This involves a good many practical difficulties which will require time to work out.

"In my view there is nothing to do but to let it be known that ships will be sold if any purchasers desire to operate them under the American flag. Until I am advised to the contrary, that policy will be maintained. But no great organization will be formed and no great effort will be made to dispose of them. The prices heretofore announced will be maintained. Beyond this is the question of a permanent merchant marine. That should be procured, regardless of cost. The thing for the Shipping Board to do now is to operate the ships in the most effective way and to open trade routes to all parts of the world.

"The future of American commerce depends on the successful operation of these ships. That point is so manifest and the consequences so vital that all our energies will be bent in that direction. It may not be amiss to add that in my personal view no steps should be taken which would permit the important ships now owned by the Shipping Board to pass from under the American flag. This does not apply to some of the smaller types which we do not need."

Youngstown Sheet & Tube Capacities

Figures revised to date on maximum capacities and equipment have been announced by the Youngstown Sheet & Tube Co., Youngstown, Ohio. Maximum capacities are announced as follows:

Coke and by-products: By-product coke, 1,260,000 tons; coal tar, 16,704,000 gal.; ammonium sulphate, 45,800,000 lb.; benzol, 3,600,000 gal.; toluol, 540,000 gal.; solvent naphthas, 131,400 gal.

Iron and steel: Pig iron, 1,250,000 tons; hand-puddled iron, 50,000 tons; Bessemer and open-hearth steel ingots, 1,477,380 tons.

Semi-finished products: Blooms, slabs, billets, sheet bars, 1,250,000 tons; skelp, 534,000 tons.

Finished products: Butt welded and lap welded pipe, 500,000 tons; sheared plates, 225,000 tons; merchant bars, 225,000 tons; sheets (average sizes and gages) 88,400 tons; wire rods, 149,650 tons; plain wire, 136,875 tons; wire nails, 73,000 tons; wire hoops, 5,475 tons; barbed wire, 52,735 tons; wire fencing, 27,375 tons; electrical conduit (steel) 30,000 tons; flexible steel armored cable, 36,000,000 ft.

These figures represent a year's output.

Total area under roof in the main, rod and wire and Hubbard, Ohio plants is 6,925,000 sq. ft., considerably more than 150 acres. The number of locomotives, standard and narrow gage, used is 28. The number of stationary steam engines in use is 130 and they develop 138,619 hp.; the number of electric motors in the plant is 2600.

Present Output of Coal and Coke

WASHINGTON, Aug. 20.—Railroad labor troubles are blamed by the U. S. Geological Survey for the decrease in the bituminous coal output. Production fell from 9,947,000 net tons for the week ending Aug. 2 to 9,407,000 tons the week of Aug. 9. The market is generally improving but the demand is yet mainly for the better grades of coal, the mines producing the lower grades still reporting time lost because of no demand. The average daily rate of production in the week of Aug. 9 was 1,568,000 tons, compared with more than 2,000,000 tons a year ago.

The production of beehive coke continues to increase, the estimates for the week of Aug. 9 placing the output at 383,000 tons, compared with 379,000 the preceding week. The gain was almost entirely in Pensylvania, the other States, except Colorado and New Mexico, recording decreases.

Increase of Living Costs

Living costs increased 5.9 per cent between March and July, 1919, according to the report of the National Industrial Conference Board. The total increase since 1914 is estimated by the board at 70.8 per cent, the highest point yet reached. The percentage of increase in the year ended June, 1919, is given as 12 per cent. The following table prepared by the board shows the principal items in the family budget and the percentage of increase since 1914 and since March of this year:

	Per Cent of Increase	
	July, 1914, to July, 1919	March, 1919, to July, 1919
Food	85	5.7
Shelter	28	4.9
Clothing	100	10.5
Fuel, heat and light	57	No change
Sundries	63	5
All items	70.8	5.9

The H. D. Evans Steel Co., 127-133 Oliver Street, Boston, is extending its warehouse space, having leased the entire building, and will move its offices to the second floor to give more storage space on the first.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
Aug.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
13.....	22.00	21.50	65.00	5.60	5.50	7.70	7.35
14.....	22.50	22.00	58.00	5.60	5.50	7.85	7.50
15.....	23.00	22.50	58.00	5.70	5.60	7.95	7.60
16.....	23.50	23.00	....	5.80	5.70	8.00	7.65
18.....	23.75	23.25	58.00	5.80	5.70	8.00	7.65
19.....	24.00	23.50	57.00	5.90	5.80	8.10	7.75

NEW YORK, Aug. 19.

All the markets exhibit a better tone and in most cases prices are advancing. Copper in second hands has been disappearing, which, coupled with a better demand, has caused values to rise. The tin market is quiet and spot metal is more plentiful. Demand for lead is better and quotations are higher. Prices for zinc have advanced on more active buying. Antimony is strong.

New York

Copper.—Several factors have contributed to strengthen the market in the past week, so that electrolytic copper has advanced fully 2c. since our last quotations. To-day it is quoted at 23.50c., New York, for early delivery, with Lake at about ⅜c. to ½c. higher, or 24c., New York. The causes of the stronger tone are the gradual disappearance of metal in second hands, the settlement of most of the major strikes in the brass industry and the better demand from consumers who realize the fundamental conditions. Producers are still adhering firmly to their quotation of 24c. for September delivery and are looking for higher costs as well as possibly increased freight rates later. Inquiry for last quarter is heavy, but producers are still disinclined to sell futures. Consumers are also interested in first quarter delivery.

Tin.—The tin arrivals, noted last week, and which amounted to 325 tons of Straits tin on one steamer alone, have caused the value of spot Straits tin to fall decidedly. While not much has changed hands enough has been disposed of to lower the price to 57c. to 58c., New York, which is nominally quoted as the market. It is stated that one or two small lots have sold as low as 56c., New York. While some of the tin was for consumption, a portion was offered for sale. On the surface the market has been quiet but fair sales have been made each day, perhaps 75 to 100 tons per day, for last quarter shipment from the East. Arrivals thus far in August have been 2630 tons, of which 1935 tons has come in at Atlantic ports. There are 5480 tons afloat, of which 2505 tons is from the Straits and Australia.

Lead.—The feature of this market is the almost complete disappearance in the last week of the cheap lots of lead in the outside market. As a result the outside price has nearly approached that of the leading interest. To-day lead for early delivery is obtainable at not less than 5.90c. to 5.95c., New York, with some sales made at 6c. by the independents or second hands, which is the quotation of the American Smelting & Refining Co. The market is strong and demand is good. The talk of a strike by miners in the Missouri districts has tended also to strengthen the market.

Zinc (Spelter).—The stronger tone of both the copper and the lead market, particularly the former, has been reflected in the zinc market, which has advanced steadily all the week. To-day prime Western for early delivery is not regarded as obtainable under 7.75c., St. Louis, or 8.10c., New York, which we quote as the market. The fact that production has been curtailed is also a bullish factor. It is estimated that present output is not over 30,000 tons per month, as against 45,000 tons for month in 1918.

Antimony.—The market is quiet but strong, with wholesale lots for early delivery quoted at 9.25c. to 9.37½c., duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 32c. to 33c., New York, for wholesale lots for early delivery.

Old Metals.—The market is a little firmer, but prices are unchanged as follows:

	Cents per lb.
Copper, heavy and crucible	22.00
Copper, heavy and wire	20.50
Copper, light and bottoms	18.00
Brass, heavy	15.00
Brass, light	11.00
Heavy machine composition	20.00
No. 1 yellow rod brass turnings	12.75
No. 1 red brass or composition turnings	16.00
Lead, heavy	5.50
Lead, tea	4.25
Zinc	6.00

Chicago

AUG. 18—Copper continues rather active as the result of sales by independent interests at a concession below the market. Spot tin is weaker as the result of expected arrivals of Straits metal in the near future. A fair amount of tin is moving at 60 to 65c. Lead and spelter are more active, the latter having advanced to 7.75c. Antimony remains dull. Scrap grades of copper and brass have advanced. We quote copper at 23c. to 23.50c. for carloads; tin, 60c. to 65c.; lead, 5.65c. to 5.70c.; spelter, 7.75c.; antimony, 10c. to 11c. On old metals we quote copper wire, crucible shapes, 17c.; copper clips, 16c.; copper bottoms, 15c.; red brass, 17c.; yellow brass, 11c.; lead pipe, 4.25c.; zinc, 5c.; pewter, No. 1, 30c.; tinfoil, 35c.; and block tin, 40c.; all these being buying prices for less than carload lots.

St. Louis

AUG. 18—The market has been quiet the past week, but closed firm at 5.60c. for lead in carloads and 7.50c. for spelter. In less than carloads lead is quotable at 5.85c. and spelter 7.75c. to 8c. Tin is quiet at 74c. in less than carloads, copper 24c. and antimony 10.50c. In the Joplin district the market has been dull with prices showing little variation. Sales have been scarcely up to the output as miners are inclined to hold the ore, so far as possible, for future developments. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 7.50c.; heavy yellow brass, 10c.; heavy red brass and heavy copper, 15c.; light copper, 13c.; pewter, 35c.; tinfoil 43c.; lead 4c.; zinc, 4c.; tea lead, 3.50c.; aluminum, 18c.

Cincinnati

AUG 18.—Copper and brass scrap is advancing again and some of the lost ground reported three weeks ago is now being recovered. Heavy copper, crucible copper and copper wire are quoted around 17.50c. Light copper is from 15c. to 16c. and heavy red brass from 17.25c. to 17.50c. Block tin pipe is weak and is worth only about 42c. to 43c. No. 1 pewter is barely holding its own at 30c. to 31c. Lead is unchanged at 4.25c.

An effective method used by the Aluminum Castings Co., Cleveland, to counteract the inclination of their workmen to discard goggles in hot weather is reported by the National Safety Council. The company found that on hot days their goggles became steamy or clouded from perspiration. To eliminate the dangerous practice of removing them, the firm gave the men neat wiping cloths, about 4 x 6 in., which may conveniently be carried in the goggle case. Each cloth carried the printed message: "Use this cloth to keep your goggles clean," and also a safety slogan.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

The prices below, except on nuts, bolts, rivets and spikes, are based on those announced at Washington by the Industrial Board on March 20, 1919, effective the following day, which since that date have largely governed market transactions, though there have been variations, as indicated in market reports on other pages.

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c.; minimum carload 46,000 lb.; Denver, 99c.; minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs:

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and Zees, structural sizes, 2.45c.

Wire Products

Wire nails, $3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50, and shorter than 1 in., $2.00. Bright basic wire $3.15 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.00; galvanized wire, $3.70; galvanized barbed wire and fence staples, $4.10; painted barbed wire, $3.40; polished fence staples, $3.40; cement-coated nails, $2.85 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60½ per cent off list for carload lots, 59½ per cent for 1000-rod lots, and 58½ per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$3.90 base
Large boiler rivets.....$4.00
½ in., 5/16 in. and 7/16 in. diameter.....60-5 per cent off list
Machine bolts, hp. nuts, ⅜ in. x 4 in.:
Smaller and shorter, rolled threads.....60 per cent off list
Cut threads .....50-10 per cent off list
Larger and longer sizes.....45-5 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅜ in. x 4 in.:
Smaller and shorter.....40-10-5 per cent off list
Larger and longer.....40 per cent off list
Carriage bolts, ¾ in. x 6 in.:
Smaller and shorter, rolled threads...50-10 per cent off list
Cut threads .....50 per cent off list
Larger and longer sizes.....40-5 per cent off list
Lag bolts .....60 per cent off list
Plow bolts, Nos. 1, 2 and 3.....50-5 per cent off list
Plow bolts, Nos. 4 to 10.....50-5 plus 20 per cent off list
Hot pressed nuts, sq. blank.....3.10c. per lb. off list
Hot pressed nuts, hex. blank.....3.10c. per lb. off list
Hot pressed nuts, sq. tapped.....2.85c. per lb. off list
Hot pressed nuts, hex. tapped.....2.85c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank.....3.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped....2.85c. per lb. off list
Semi-finished hex. nuts:
⅜ in. and larger.....70 per cent off list
9/16 in. and smaller.....75-10 per cent off list
Stove bolts in packages.....75-10 per cent off list
Stove bolts in bulk.....75-10-2½ per cent off list
Tire bolts .....60-10 per cent off list

The above discounts are from Aug. 4, 1919.
All prices carry standard extras, Pittsburgh basis.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers $52; chain rods, $60; screw, rivet and bolt rods and other rods of that character, $60. Prices on high carbon rods are irregular. They range from $65 to $75, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes ½ in., 9/16 and larger, $3.35 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes ⅜ in., 7/16 in. and smaller, $3.85 to $4 per 100 lb. in lots of 200 kegs of 200 lb. each or more; track bolts, $4.35 to $4.50 per 100 lb. in carload lots of 200 kegs or more, with the usual extras for small lots. Boat and barge spikes, $3.85 to $4 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh.

Terne Plates

Prices of terne plate are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. from mill. Prices on bar iron are 2.75c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	50½	24	⅛ and ¼	29½	2½
½	54½	40	⅜	30½	3½
¾ to 3	57½	44	½	34½	16½
			¾ to 1½	30	23½

Lap Weld

2	50½	38	1¼	24½	9½
2½ to 6	53½	41	1½	31½	17½
7 to 12	50½	37	2	32½	18½
13 and 14	41	..	2½ to 6	34½	21½
15	38½	..	7 to 12	31½	18½

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	46½	29	⅛, ¼ and ⅜	28½	11½
½	51½	39	½	33½	20½
¾ to 1½	55½	43	¾ to 1½	39½	24½
2 to 3	56½	44			

Lap Weld, extra strong, plain ends

2	48½	37	1¼	25½	10½
2½ to 4	51½	40	1½	31½	17½
4½ to 6	50½	39	2	33½	20½
7 to 8	46½	33	2½ to 4	35½	23½
9 to 12	41½	28	4½ to 6	34½	22½
			7 to 8	26½	14½
			9 to 12	21½	9½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
	Per Net Ton		Per Net Ton
3½ to 4½ in.	40½	3½ to 4½ in.	—16
2½ to 3¼ in.	30½	3 to 3¼ in.	— 1½
2¼ in.	24	2½ to 2¾ in.	+ 1
1¾ to 2 in.	19½	2 to 2¼ in.	+10
		1¾ to 1⅞ in.	+20

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅜ in.	257	2¾ to 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiations.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

Blue Annealed—Bessemer

	Cents per lb.
No. 8 and heavier	3.50
Nos. 9 and 10 (base)	3.55
Nos. 11 and 12	3.60
Nos. 13 and 14	3.65
Nos. 15 and 16	3.75

Box Annealed, Ore Pass Cold Rolled—Bessemer

Nos. 17 to 21	4.15
Nos. 22 to 24	4.20
Nos. 25 and 26	4.25
No. 27	4.30
No. 28 (base)	4.35
No. 29	4.45
No. 30	4.55

Galvanized, Black Sheet Gage—Bessemer

Nos. 10 and 11	4.70
Nos. 12 and 14	4.80
Nos. 15 and 16	4.95
Nos. 17 to 21	5.10
Nos. 22 to 24	5.25
Nos. 25 and 26	5.40
No. 27	5.55
No. 28 (base)	5.70
No. 29	5.95
No. 30	6.20

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	4.15
Nos. 17 to 21	4.20
Nos. 22 to 24	4.25
Nos. 25 to 27	4.30
No. 28 (base)	4.35
No. 29	4.40
No. 30	4.40
Nos. 30½ and 31	4.45

PERSONAL

The reorganized official personnel of the Inland Steel Co., Chicago, includes men who have devoted the better parts of the business careers to building up the organization with which they are identified. Philip Dee Block, recently elected president, as announced in THE IRON AGE of Aug. 14, was born in Cincinnati on Feb. 16, 1871, and from 1888 to 1903 was with the Block-Pollak Iron Co., Chicago and Cincinnati. From 1903 until his election as president, he was vice-president and treasurer of the Inland Steel Co. He is also president of the Inland Steamship Co. and the Inland Colliers Co. and vice-president of the Orwell Iron Co. and the C. W. & F. Mining Co., all subsidiaries of the Inland Steel Co. Leopold E. Block, the new chairman of the board of directors, was born in Cincinnati on Jan. 13, 1869, and has spent his entire life in the coal and iron trade, first in his native city and subsequently in Chicago. From 1897 to 1905 he was treasurer and director of the Inland Coal & Washing Co. and since that time has been vice-president and treasurer of the Inland Steel Co. As chairman of the board, he will retain his duties as treasurer of the corporation. G. H. Jones, first vice-president, was born in England on Jan. 25, 1856, and came to this country in 1871. For 22 years he was associated in various capacities with Hall, Kimbark & Co., wholesale iron and steel, Chicago. At the time he left this company he was general manager of sales of the country department. In 1893, he participated in the organization of the Inland Steel Co. in conjunction with the Porter and Block interests. In 1897 he helped organize the Inland Iron & Forge Co., East Chicago, Ind., and in 1899 assisted in organizing the Buffalo Steel Co. Mr. Jones has been a leading officer of the Inland Steel Co. since its inception. Edward H. Adams, recently elected vice-president, was born at Cherry Valley, Ill., on Dec. 1, 1876. For a time he was identified with the Buda Co. at Harvey, Ill., where incidentally he served two consecutive terms as mayor. For a number of years he has been secretary of the Inland Steel Co.

G. H JONES
First Vice-President

P. D. BLOCK
President

E. M. ADAMS
Vice-President

OFFICIALS OF INLAND STEEL CO. ELECTED TO ADVANCED POSITIONS

F. H. Tackaberry, of the American Steel Export Co., New York, left Aug. 14 on the Adriatic to visit London, Brussels, Christiania, Copenhagen, Stockholm, Amsterdam and Antwerp in the interest of the company.

Linford C. White has severed his connection with Chapman & Bangs, wholesale hardware, Bridgeport, Conn., to join the New England selling force of the Standard Tool Co. He was formerly employed by Hotchkiss & Templeton, mill factory supplies, Waterbury, Conn.

Presley Hamilton has opened offices in the Singer Building, New York, as eastern sales agent for the Keystone Bronze Co., Pittsburgh, McAleenan Brothers Co., Pittsburgh, Pittsburgh Knife & Forge Co., Pittsburgh, and the Youngstown Foundry & Machine Co., Youngstown, Ohio. Mr. Hamilton was formerly traveling representative for the Midvale Steel & Ordnance Co. and later for the Brier Hill Steel Co.

Included in the directorate of the new organization of the Eisemann Magneto Corporation, Brooklyn, recently incorporated with an active capital of $1,650,000, are: Franklin S. Jerome, Seymour Mfg. Co., Seymour, Conn., and William N. Shaw, vice-president New York Air Brake Co.

Capt. H. H. Peck, Ordnance Department, formerly western sales agent for the Scullin Steel Co., arrived from France on the Imperator, Aug. 10, after two years' service in the American Expeditionary Force. His present address is 349 Sherman Avenue, New Haven, Conn.

L. W. Cash, for the past two years purchasing agent of the Wisconsin Parts Co., formerly the E. B. Hayes Machinery Corporation, Oshkosh, Wis., has resigned, to take effect Sept. 1.

Maj. H. C. Bayless, formerly mechanical engineer of the Soo Line and the Great Northern Railway, but more recently chief inspector of ordnance for the War Department of the Standard Steel Car Co., Hammond, Ind., has joined the Superior Pulverizer Co., 1425 First National Bank Building, Chicago, as combustion engineer and manager of the coal pulverizing department, and will have entire charge of engineering, sales and the general supervision of coal installations.

Harry C. Williamson is again in charge of the Indianapolis office of the Betz-Piere Co., airplane parts and supplies, Cleveland. He has been with the company about six years, and returned recently from France, where he served with the American Expeditionary Forces.

Leonard B. Heller, member of the firm of Ogleby, Norton & Co., iron ores, Cleveland, has returned to his office after a serious illness of two years and will give special attention to mining operations.

James F. McCarthy of the Boston office of Henry Prentiss & Co., machine tools, New York, was seriously though not dangerously injured, and Harry W. Hill, superintendent of the lens department of the American

Optical Co., Southbridge, Mass., was dangerously hurt, in a motor car accident, Aug. 13. The automobile in which they were running in the night struck a disabled truck standing without tail lights in the highway.

The following officers have been elected by the Doble-Detroit Steam Motors Co.: M. J. Hammers, president; C. L. Lewis, vice-president; Harrington E. Walker, treasurer; F. R. Humpage, secretary, and E. M. Mistersky, assistant secretary and assistant treasurer. In addition to the officers the following directors have been elected: A. B. Frenier, patent counsel for the company; Lawrence R. Wilder, president Amalgamated Machinery Corporation, Chicago, and G. A. Reuter, president G. A. Reuter Co., Chicago.

C. I. Sterrett has resigned as purchasing agent of the Republic Iron & Steel Co., Youngstown, Ohio, to become identified in an executive capacity with the Kelly Island Lime & Transport Co., Cleveland. Edgar F. Kidd, recently promoted to assistant traffic manager, is acting as traffic manager owing to the death of Henry R. Moore.

C. E. Duncan, general superintendent Pacific Coast Steel Co., San Francisco, has resigned on account of his health and has been succeeded by George Foraker, formerly assistant general superintendent.

E. B. Gould will have charge of the new office of the Goulds Mfg. Co., Seneca Falls, N. Y., manufacturer of pumps, which will be opened in the Dime Bank Building, Detroit, Sept. 1. Mr. Gould recently returned from 18 months' service in France.

Louis E. Strothman, manager of the steam turbine and pumping engine department Allis-Chalmers Mfg. Co., Milwaukee, resigned Aug. 15 to become associated with the Richardson-Phenix Co., Milwaukee, as vice-president and general manager. The company manufactures mechanical lubricating devices. J. William Peterson is president and treasurer. Mr. Strothman joined the Milwaukee works of the Allis-Chalmers Co. in 1902.

William H. Moreman, in charge of the sash department of the Truscon Steel Co., Youngstown, has resigned, effective Sept. 1, to become general superintendent of the Milwaukee Corrugating Co., Milwaukee, Wis. He has been with the Truscon Co. since 1908. Associates presented him with a gold watch.

Arthur B. Reynders, former director of production of the Westinghouse Electric & Mfg. Co. at East Pittsburgh, has been made works manager of the East Springfield plant, Springfield, Mass. He is now supervising the installation of new machinery at this plant for the manufacture of small power motors, and automobile starting, lighting and ignition equipment. A. E. Kaiser, who has been assistant to director of production since 1912, has been appointed director of production to fill the vacancy caused by Mr. Reynders' new appointment.

F. H. Payne, first vice-president Greenfield Tap & Die Corporation, Greenfield, Mass., became a general partner of Tucker, Anthony & Co., members of the New York and Boston Stock Exchange, Aug. 11. He will remain in his present position with the Greenfield corporation, living in New York winters and spending his summers in Greenfield.

Henry H. Barbour, vice-president Consolidated Steel Corporation, 165 Broadway, New York, is now visiting the Pacific Coast in a trip of several weeks' duration.

A. C. Lorian has been made purchasing agent of the Clinton-Wright Wire Co., Worcester, Mass.

The Hammond Steel Co., Inc., Milton Avenue, Solvay, near Syracuse, N. Y., has arranged for a note issue of $600,000 for general expansion. The company will build two extensions to its works, about 40 x 60 ft. and 80 x 250 ft., to cost in excess of $200,000, including equipment installation. The plant specializes in the manufacture of high grade tool and alloy steels under electric furnace process. F. B. Scott is president.

Hanna Partners Acquire Interest in a St. Louis Company

The members of the firm of M. A. Hanna & Co., Cleveland, acquired an interest in the St. Louis Coke & Chemical Co., which is allied with the National Enameling & Stamping Co., and has sold $5,000,000 of preferred stock for the building of its new coke oven and blast furnace plants now being constructed at Granite City, Ill. The announcement of the intention to build the new plants was made in THE IRON AGE of March 27, 1919. It is understood that Lake Superior ore will be used to a large extent by the new furnace, and it is expected that such railroad rates will be obtained as will permit the delivery of the ore at Granite City at a reasonable rate.

Col. F. B. Richards, one of the members of the firm of M. A. Hanna & Co., will be elected a director of the St. Louis Coke & Chemical Co. Colonel Richards has had long experience as a blast furnace operator and seller of iron ore and pig iron.

Cammell-Laird to Increase Railroad Equipment Manufacture

WASHINGTON, Aug. 19.—Trade Commissioner H. G. Brock at London has reported to the Department of Commerce that negotiations for the acquisition of the State ordnance factory at Nottingham by the steel manufacturers, Cammell, Laird & Co., Ltd., Sheffield, Birkenhead, and Penistone are far advanced. The factory is to be adapted to the manufacture of steel railroad cars of the most approved type; later passenger coaches may also be manufactured, but the immediate object is the production of steel freight cars, as the springs, tires and other parts can be built at the Sheffield works of the firm. During the war Cammell, Laird & Co. undertook the designing, erection and management of the ordnance factory at Nottingham without remuneration of any kind. The factory was originally laid out for the manufacture of shells, but in its second phase started the construction of 18-pounder guns, of which 11 per week were being produced at the signing of the armistice, with a weekly output of 5000 9.2-in. shells and 13,500 6-in. shells. This concern is now giving up what was chiefly a large financial interest in the shipbuilding establishment of the Fairfield Shipbuilding & Engineering Co. at Govan, and its place will be taken by the Northumberland Shipbuilding Co. of Howdon-on-Tyne. During recent years the last-named company has strengthened its position and early this year acquired the shipbuilding business of William Doxford, Ltd., of Sunderland, at a cost of $15,000,000.

Standardization of Ship Materials

A 70-page pamphlet has just been published containing the paper on "Standardization of Ship Materials," prepared by Fred T. Llewellyn of the Federal Shipbuilding Co., Kearney, N. J., and the Chickasaw Shipbuilding Co., Mobile, Ala., for the meeting of the American Iron and Steel Institute in New York, May 23, 1919. Mr. Llewellyn's paper, as heretofore indicated in these columns, traced the history of standardization in connection with the materials used in the construction and equipment of steel cargo ships, with special attention to the movement for standardization in connection with the construction carried on during the war by the Emergency Fleet Corporation. In the pamphlet are given 50 pages of appendices containing a detailed classification of all forms of steel and other materials used in ships, also the quantities, sections, weights, etc., of rolled steel shapes tabulated according to designs, shipyards and hulls. The pamphlet presents in form for preservation the very valuable data developed by the cooperation of the Emergency Fleet Corporation, the shipyards and the steel companies in the remarkable shipbuilding campaign of the war.

The Pittsburgh Basing Point Controversy

WASHINGTON, Aug. 20.—The Federal Trade Commission is now receiving briefs and answers in the Pittsburgh basing point controversy. It is planning to make these public about Sept. 1, when it will fix the date for a general hearing. In the meantime the members of the Commission and their experts are attempting to summarize the various suggestions both as to jurisdiction and on the merits of the controversy. The Commission is also planning to study analogous questions such as the Elgin basing for butter and the New York basing for sugar prices. The Commission has never ruled on these questions, but its ruling on the steel controversy would have a far-reaching effect with reference to them. Commissioner Murdock said:

> There is no doubt but that this is the biggest question we have ever been called upon to determine. We are going to do it carefully and we want to hear from every side of it. Every one will have a chance to be heard. In the meantime we are familiarizing ourselves with our jurisdiction, which is a question that can be raised at any time. We are not like a court which must pass upon the question of its jurisdiction first. But we need not take up this until final arguments are heard. Then, if we find there is doubt about our jurisdiction, we can make any recommendations which we may think warranted.

It is expected also that various departments of the Government will have an opportunity to submit their views. The Navy Department, particularly, is vitally interested in the question of basing point. In its latest steel bids it asked for the submission of bids alternately on the "Pittsburgh basing price, f.o.b. mill," and on "net price, f.o.b. mill." The bidders, however, made the Pittsburgh basing price govern the net price, thus eliminating competition between the two quotations.

Accident Prevention Record of the American Rolling Mills Co.

Noteworthy accomplishments in accident prevention are indicated in a report of accidents in the plant of the American Rolling Mill Co., Middletown, Ohio, during the first five months of 1919, as compared to the corresponding period of 1918, submitted to the National Safety Council by R. G. Adair, safety engineer of the company. This report shows a reduction of 91.9 per cent in the total compensation paid by the company during the period mentioned, a reduction of 46 per cent in the total number of lost time accidents and a reduction of 51 per cent in the total days lost as the result of accidents.

The tabulation shows particularly that the total outlay for compensation of accidents amounted to $1.71 for the month of May, 1919, in a plant employing 3500 men. The decrease in accidents shown in this report is the more significant in that the 1918 figures, which are used as a basis of comparison, show a relatively low accident experience. A digest of the report follows:

Five Months	Total Compensation	Compensation per 100 Men	Per Cent of Reduction
1918	$20,638.22	$412.76	
1919	1,340.26	38.29	91.9
	Total Lost Time Accidents	Lost Time Accidents per 100 Men	
1918	210	4.2	
1919	83	2.3	46
	Total Days Lost	Days Lost per 100 Men	
1918	2,523	50.4	
1919	868	24.8	51

The Lorraine Pig Iron Sales to Great Britain

In connection with the purchase by British steel makers some weeks ago of 46,000 tons of basic iron held by the French Government in Lorraine, it is now stated that the French Government guaranteed delivery at Antwerp at 212½ francs per metric ton, which at the recent rate of exchange is equivalent to about £7 per ton. It is stated that the British manufacturers have been considering an offer from the French Government of the surplus output of the Lorraine furnaces for the next 12 months, the amount being estimated at 10,000 tons per week. Foundry iron is scarce in Great Britain and if the Lorraine basic iron is taken, it might be possible to turn some British furnaces from basic to foundry iron.

Cleveland Strike Vote

CLEVELAND, Aug. 19.—Henry W. Raisse, editor *Federationist*, Cleveland labor organ, who will carry Cleveland steel and iron workers' verdict on the proposed nation-wide steel strike to the conference of iron and steel union chiefs at Youngstown to-morrow, says: "Indications are that the differences between the steel workers and their employers may be settled amicably. The fight centers against the United States Steel Corporation and the right of collective bargaining is one of the great objects sought."

"I shall report to the conference," Mr. Raisse continued, "that Cleveland workers stand 100 to 1 in favor of the strike."

Jenifer Furnace Again Operated

Jenifer blast furnace at Jenifer, Ala., was blown in on July 27 and is making pig iron from local brown ores, the iron running high in silicon and manganese and low in sulphur and phosphorus. The furnace has been practically rebuilt. The iron mines have been supplied with new machinery and washers and a new and well-equipped mine has been opened on the company's coal property at Weller, Ala., greatly increasing the output there. The present owner, the Jenifer Iron Co., purchased the properties from the Central Alabama Coal & Iron Co. W. Aubrey Thomas, Jenifer, is president; John M. Thomas, Milwaukee, vice-president, and T. E. Thomas, Niles, Ohio, secretary and treasurer. The furnace was last active in 1903.

Structural Fabricating Orders Increasing

New orders for bridge and structural work placed with the fabricating shops of the country in the month of July amounted to 74 per cent of the total shop capacity or 133,200 gross tons, as compared with 65 per cent or 117,000 tons in June, according to records of the Bridge Builders and Structural Society, 30 Church Street, New York, compiled by George E. Gifford, secretary. This compares favorably with business placed in July in previous years, which averaged 71 per cent for the seven-year period 1912-1918, and exceeds the highest yearly average in that period, 72 per cent in 1915.

The Jones & Laughlin Steel Co., which has been an extensive buyer of real estate during the past year in the Hazelwood district, Pittsburgh, has increased its holdings in that section by the purchase of 800 ft. of property fronting on Second Avenue, paying approximately $200,000. The property is vacant and adjoins the mill property of the steel company. By this purchase the Jones & Laughlin Steel Co. now owns all the land between Second Avenue and the Monongahela River up to the plant of the National Tube Co.

At the annual meeting of the stockholders of the Aetna Foundry & Machine Co., Warren, Ohio, the following directors were elected: M. W. McClane, W. M. McKee, G. P. Gillmer and V. E. Rehr. At the directors' meeting the following officers were elected: M. W. McClane, president; V. E. Rehr, vice-president; G. P. Gillmer, treasurer, and M. C. Boyd, secretary.

The Electric Furnace Construction Co., Finance Building, Philadelphia, has an order from the Hammond Steel Co., Syracuse, N. Y., for one 3-ton furnace for the manufacture of high-grade tool steels. A Greaves-Etchells furnace is also being installed for the Hong Kong Steel Foundry Co., China.

"The Effect of Rate of Temperature Change on the Transformation in an Alloy-Steel," is the title of Scientific Paper No. 335 of the U. S. Bureau of Standards. The author is Howard Scott, assistant physicist. Cooling curves on an alloy steel of the composition: C., 1.75; Mn., 1.26; Cr., 15.0; Co., 2.90 are given.

COLD FINISHED STEEL

Net Price Basis with Extras to Supersede List and Discount Pricing Basis

Leading manufacturers of cold finished steel and shafting have changed from a list and discount method of quoting their products to a net price basis with extras. About 15 manufacturers out of 23 engaged in this industry began quoting on the new basis on Monday, Aug. 18. The list of extras, as adopted, means a slight reduction in price on some sizes, though there are variations where the new extras and differentials make the net price slightly higher. The base price is $3.60 per 100 lb., f.o.b. Pittsburgh, and the base size is now 2¼ to 3 in. rounds instead of 2 to 3 in., as has been quoted on the card adopted March 15, 1915, and revised Jan. 1, 1919. The list price on the old card was $5 per 100 lb., and deducting the 28 per cent discount on carload lots, which has been in effect since March 21, makes $3.60, which is the same as the new base price now in effect.

The fifteen manufacturers, who have already adopted the new basis of quoting, produce 85 per cent of the total output of the cold rolled steel industry, which has an annual capacity of 700,000 to 750,000 net tons. Three of the manufacturers who have adopted the new method of quoting, produce 60 per cent of the total output of cold finished steel.

The change to the net price basis is made for several reasons, chief of which is that the transition in the industry in recent years has made the list and discount basis a cumbersome one, both for producers and consumers. Shafting now forms less than 5 per cent of the total production of cold finished steel, and the character of the trade has changed greatly, due to the increasing demand for screw machine stock and cold finished bars used in the manufacture of automobiles, agricultural implements, machine tools, sewing machines, typewriters, etc.

Quantity differentials have been increased considerably in the new card. For less than 1000 lb., 35c per 100 lb. net is added, as compared to 5c to 20c on the old card, while on quantities over 1000 lb. but less than 2000 lb. an extra of 15c per 100 lb. net will be charged instead of 5c as on the old card. Following is the new card:

Standard Classification of Extras on Cold Finished Steel and Shafting

ROUNDS

In.	Per 100 lb.	In.	Per 100 lb.
⅛ to 5/32	$2.25	3 1/16 to 3 7/16	$0.25
3/16 to 7/32	1.50	3½ to 3 15/16	.50
¼ to ⅜	.90	4 to 4 7/16	.80
7/16 to 9/16	.60	4½ to 4 15/16	.90
⅝ to ¾	.40	5 to 5 7/16	1.00
13/16 to 1 1/16	.30	5½ to 5 15/16	1.50
1⅛ to 1 7/16	.25	6 to 6 7/16	2.00
1½ to 2 3/16	.15	6½ to 7	2.50
2¼ to 3	Base		

SQUARES AND HEXAGONS

In.	Per 100 lb.	In.	Per 100 lb.
⅛ to 5/32	$2.75	⅞ to 1 5/16	.70
3/16 to 7/32	3.00	1¾ to 2	.60
¼ to 5/16	2.00	2 1/16 to 2 7/16	1.00
⅜ to 7/16	1.35	2½ to 3	1.50
½ to ⅝	1.00	3 1/16 to 4	2.00
11/16 to 13/16	.80		

FLATS

Thickness in	Width in Inches						
In.	¼	5/16 to ½	9/16 to 23/32	¾ to 1	1 1/16 to 1½	1 9/16 to 3	Wider than 3
⅛ and 5/32	$8.50	$6.50	$5.50	$4.50	$3.50	$2.50	$2.50
3/16 to 5/16	7.50	5.50	5.00	3.50	2.50	1.50	2.50
⅜ to 7/16	...	4.50	4.00	2.50	2.50	1.50	2.50
½ to 9/16	...	...	3.00	1.50	1.50	1.25	2.50
⅝ to 11/16	...	...	2.50	1.25	1.25	1.25	2.50
¾ to 15/16	...	...	...	1.25	1.25	1.25	2.50
1 to 1 7/16	...	...	...	...	1.25	1.25	2.50
1½ to 1 11/16	...	...	...	...	...	1.25	2.50
1¾ to 1 15/16	...	...	...	...	...	1.25	2.50
2 to 2 15/16	...	...	...	...	...	1.25	2.50

EXTRA FOR ODD AND INTERMEDIATE SIZES

The following sizes in rounds, hexagons and squares shall be considered standard:

By 64ths to 1 in. inclusive.
By 32nds, 1 1/32 in. to 1 31/32 in. inclusive.
By 16ths, 2 in. to maker's limit.

All odd and intermediate sizes (excepting those allowing a total tolerance of 0.008 in. and such specifications shall be for not less than 2000 lb. of a size), not less than 25c. per 100 lb. net extra, in addition to the usual extras for accuracy, etc.

EXTRAS FOR CHAMFERING

(For Automatic Screw Machine Use Only)

In.	Rounds, Per 100 lb. Net	Hexagons and Squares, Per 100 lb. Net
7/16 to ⅝	$0.13	$0.15
11/16 to 15/16	.10	.13
1 to 2	.065	.115
2 1/16 and larger	.04	.10

These extras apply on lengths 10 ft. and longer and one end bar only.

For sizes smaller than 7/16 in. and bars shorter than 10 ft., special prices will be quoted.

BOXING AND BURLAPPING

	Per 100 lb. Net
Boxing (minimum 50c.), domestic shipment	$0.40
Boxing (minimum 50c.), export shipment	.50
Burlapping (minimum 25c.), full length	.25
Burlapping (minimum 25c.), ends only	.10

PISTON ROD STEEL

Uniformity to size and carefully selected surface finish, 50c. per 100 lb. net extra, in addition to usual extras for accuracy and short and long lengths.

ROLLER BEARING STEEL

Special analysis and finish (for special accuracy, regular extras will apply), $1.00 per 100 lb. net extra.

EXTRAS FOR ACCURACY—ROUNDS

For accuracy from exact size to 0.0015 in. under, sizes 3 in. diameter and smaller, 25c. per 100 lb. net.

For accuracy from exact size to 0.001 in. under, or from exact size to not more than 0.001 in. either way, sizes 2½ in. diameter and smaller, 50c. per 100 lb. net.

For accuracy within 0.0005 in. either way and from exact to 0.001 in. over size, sizes 2 in. diameter and smaller (standard sizes only), $1.00 per 100 lb. net.

For accuracy 0.001 in. either way or from exact size to 0.001 in. over, or from exact size to 0.001 in. under—sizes 2 in. diameter and smaller (odd and intermediate sizes), $1.00 per 100 lb. net.

Squares, Hexagons and Flats—double above extras.

For accuracy, carbon 0.31 per cent and over—double above extras.

EXTRAS FOR SPECIAL AND HIGH CARBON OPEN-HEARTH STEELS

	Per 100 lb. Net
Specified analysis—Carbon 0.30 per cent and less	$0.25
Specified analysis—Carbon 0.30 per cent and less, sulphur guaranteed 0.05 per cent and under	.50
Specified analysis—Carbon 0.31 per cent to 0.50 per cent	.50

QUANTITY DIFFERENTIALS

All specifications for less than 2000 lb. of a size will be subject to the following extras, the total weight of a size ordered to determine the extra, regardless of length and regardless of the exact quantity actually shipped:

	Per 100 lb. Net
1000 to 1999 lb.	$0.15
Less than 1000 lb.	.35

EXTRAS FOR LONG AND SHORT LENGTHS

In.	Rounds	Squares	Hexagons	Flats
3 to 5 15/16	$1.50	$1.50	$1.50	$3.00
6 to 11 15/16	.75	.75	.75	1.50
12 to 23 15/16	.30	.60	.30	.75
24 to 59 15/16	.15	.30	.15	.40

	Per 100 lb. Net
Lengths longer than 24 ft. and less than 30 ft.	$0.50
30 ft. and less than 35 ft.	1.00
35 ft. and less than 40 ft.	1.50
40 ft. and less than 45 ft.	2.00
45 ft. and longer	2.50

Extras for long lengths apply on rounds, squares, hexagons and flats.

FREIGHT ALLOWANCES AND DELIVERY

The price quoted is base, Pittsburgh. If shipment is made from a point other than Pittsburgh (or Pittsburgh district), the freight from Pittsburgh to destination will be added, and the freight from shipping point to destination deducted. No freight to be allowed or paid by shipper on car blocking.

Possible Federal Control of Fuel

WASHINGTON, Aug. 20.—Although the Fuel Administration still has all the powers conferred by the Lever act to control the coal industry, no one in Washington is in a position to say whether they would be revived to prevent a fuel shortage this fall. They probably would be. Several measures have been introduced in Congress looking toward an investigation both of the Fuel Administration and of the coal operators' efforts to hasten summer purchases by rumors of fall and winter shortages. If the Fuel Administration again takes control of the coal situation it will be more likely on account of railroad strikes if they materialize than because of any shortage in mine production.

Machinery Markets and News of the Works

EXPORT PROSPECTS GOOD

Belgians May Absorb War Machines

Sweden Preparing for Activity—Domestic Demand Fair—Higher Prices Predicted

In no direction is there what might be termed a rush of business, but machinery distributing centers continue to experience the steady influx of orders from scattered sources for miscellaneous machines which go to make up a satisfactory aggregate. In New York the situation is quieter, intending buyers showing a tendency to postpone action on known needs.

From New England comes an authoritative prediction that the prices of machine tools will advance to levels higher than any attained during the war, the opinion being based on the steadily advancing costs of production. Cincinnati also makes a point of the extent to which costs advanced in July.

An interesting contribution is that from New England analyzing the heavy demand which has come from industries more or less peculiar to that territory, such as the textile field. Both machine-tool sellers and the supply houses have experienced a much heavier demand because of the busy and prosperous state of these industries.

In the New York market attention is directed to the opportunities which exist in Sweden, these being reported by the American Trade Commission at Stockholm. Swedish factories are preparing for an era of great activity and they are reported as being in need of almost every type of machine tool, as well as cranes and other lifting apparatus, measuring instruments, small tools and belting. It is emphasized that tools made for Sweden must be according to metric measurements. Leo H. Strauss, secretary to the American Commission in Stockholm, writes that American manufacturers should act promptly if they would secure a share of the business indicated.

An inquiry for 15 planing machines has been received in New York. Cincinnati tool builders have done some business of late with Spain and also have made shipments to France and England.

While business has been somewhat quieter in Chicago, and several rather unfavorable portents are seen, a source of optimism is the prospect of large buying of war tools by the Belgians. A commission from that country is in Chicago and has looked over the Government stock of used tools there stored and is said to be contemplating the purchase of some 3000 machines and perhaps more. The Belgians are reported to be in need of around 60,000 tools, and they would rather purchase in the United States than from Germany. They hope to induce the United States Government to accept three-year notes.

In Detroit building is proceeding at a heavy rate, among the plans filed in one week being four large factories. In Milwaukee the demand is broadening.

New York

NEW YORK, Aug. 18.

Business remains quiet, as it has been since the beginning of the month. A notable feature of the situation is that there are a goodly number of inquiries out for some classes of machines, but salesmen encounter a disposition on the part of the intending buyers to hold off in placing orders. Export inquiries are fewer than they have been, and some of those which do appear do not convince sellers that the inquiring parties have authority to place the orders. On the other hand, the impression exists that these inquirers are making speculative attempts to obtain data which they, in turn, may submit to the real principals. When these principals buy they are pretty likely to do so direct.

The Taft-Peirce Mfg. Co., Woonsocket, R. I., manufacturer of gages, thread millers, grinders and inspection and production tools, is receiving many inquiries from England, France, Switzerland and Holland and a few from Italy and South American countries, but resulting business is light because of the high rates of exchange. The inquiries from France indicate a tendency on the part of manufacturers in that country to adopt more efficient production methods than they used before the war.

An inquiry has been received here for 15 planing machines which are wanted in Sweden. The machines wanted are of the type made by the Powell Machine Co., Worcester, Mass., and the name of the intending buyer was not divulged.

Leo H. Strauss, secretary to the American Trade Commissioner, Stockholm, Sweden, states in Commerce Reports for Aug. 12 that there is a demand in Sweden at the present time for hand, vertical, horizontal and universal milling machines; turret and automatic lathes and transmissions, single and multiple drilling machines, presses of various types, tool grinders, shapers, and buffing and tiling machines. Mr. Strauss also says there is a good field in Sweden for electric welders, as there are very few there. He also sees opportunities for small tools, lifting apparatus and belting. He points out that all measuring machinery and apparatus must be gaged in accordance with the metric system. Factories in Sweden are preparing for unusual activity and many new concerns are being established, and it is suggested by Mr. Strauss that immediate action is necessary if American firms are to get their share of the business in supplying equipment.

The demand for cranes does not present many new aspects. The Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., has purchased a 5-ton crane, and the American Tube & Stamping Co., Bridgeport, Conn., purchased two 3-ton cranes.

While selling agents are finding new demand quieter, the tool builders are relatively busy, because of the excellent volume of business placed in July and the heavy buying by automobile and other interests in the Middle West. Deliveries are not easy within 30 to 60 days with many firms. A maker of forging machinery has requested his representative to secure extensions of delivery on machines of some sizes because of the pressure in the departments in which they are made.

The Community Motion Pictures Bureau announces that it has accepted the resignation of L. W. Atwater, who, as acting director of the material department of the company, has been its purchasing agent. In the future purchase orders will be signed by Lester D. Mayne.

In order to keep pace with the times and the increasing volume of business, the stockholders of the A. R. Purdy Co., 127 Christopher Street, New York, authorized the board of directors to increase the capitalization from $10,000 to $100,000. This increase will enable the firm to better serve its clients and to effect the general improvements necessitated by the growth of business. There will be no change in the management of the company. A new warehouse has recently been leased at 506 Hudson Street, which after alterations has been connected with the main warehouse and offices.

The Adirondack Steel Foundries Corporation, Colonie, N. Y., has awarded a contract to the Crowell-Lundroff-Little Co., Cleveland, for a new steel foundry to cost about $300,000, including equipment. C. W. Sherman, associated with the Dominion Steel Co., Hamilton, Ont., is president of the company. E. C. McDowell and L. E. Larson, temporarily located at Hotel Ten Eyck, Albany, are chief engineer and

superintendent, respectively. The company recently increased its capital to $1,600,000 for expansion.

The Foster Brothers Mfg. Co., Broad Street, Utica, N. Y., manufacturer of iron and brass beds, is building an addition to its four-story plant to cost about $10,000.

Fred Blattner machinist, 223 Maujer Street, Brooklyn, has awarded a contract to Joseph Kist, 938 Metropolitan Avenue, for a new one-story shop, 50 x 174 ft., on Grand Street near Morgan Avenue, to cost $15,000.

The Steel Piston Ring Co., New York, has been incorporated with a capital stock of $50 000 by A. J. H. Kuhsiek, A. Glick and A. Mayer, 131 Rivers de Drive, to manufacture piston rings, etc.

The Rhythmyk Shock Absorber Corporation, New York, has been incorporated with an active capital of $25,000 by Vans Lindsley and B. H. Trask, 25 Broad Street, to manufacture shock absorbers.

The General Metal Crafts Co., New York, has been incorporated with a capital stock of $100,000 by J. Agazim, G. G. Greenburg and G. T. Cullen, 44 East Thirty-fourth Street.

The Seymour Mfg. Co., 31 West Twenty-first Street, New York, manufacturer of brass and other metal products, with works at Seymour, Conn., has increased its capital stock from $20,000 to $100,000.

The Eris Stamping & Mfg. Co., New York, has been incorporated with a capital stock of $30,000 by M. Sparrow, M. Brandt and S. Friedman, 855 Tremont Avenue, to manufacture metal stampings, etc.

The Federal Ship & Engine Repair Co., New York, has been incorporated with a capital stock of $25,000 by J. M. Hannan, F. J. McHugh and J. Harris, 1545 Broadway.

The American Aero Parts Corporation, Hoboken, N. J., has been incorporated with a capital of $500,000 by James M. White, Hoboken; James Thomson, Lyons, N. J., and William Gordon, Union, N. J.

The James Craig Engine Works, Garfield Avenue, Jersey City, N. J., has filed plans for a one-story addition to cost about $17,000.

The Pusey & Jones Co., Wilmington, Del., has acquired about five acres at Williamstown, N. J., as a site for a new iron-working plant, to comprise machine shop and foundry.

The engine plant at the works of the Independent Brick Co., Bordentown, N. J., was partially destroyed by fire, Aug. 13, with loss estimated at $10,000.

The Sipp Machine Co., Keen Street and Erie Railroad, Paterson, N. J., manufacturer of warping and winding machinery for textile mills, has awarded a contract to O. W. Shelly, 1 West Thirty-fourth Street, New York, for a two-story addition to its machine shop, 45 x 85 ft., to cost $25,000 including equipment.

The Bureau of Yards and Docks, Navy Department, Washington, will build a two-story dirigible hangar at Lakehurst, N. J., 354 x 804 ft., to include assembling and repair work, etc.

The Siegler-Hobson Engineering Co., Jersey City, N. J., has been incorporated with a capital stock of $10,000 by George Siegler, Jersey City; and Christopher R. Hobson, Westfield, N. J., to manufacture machinery and parts.

The National Asbestos Mfg. Co., Jersey City, N. J., has been incorporated with a capital stock of $1,500,000 by Edward T. Connell, Curt R. Burkhardt and John A. Scharwarth, to manufacture asbestos coverings.

Kimelblatt, Ross & Sisti Co., New York, has been organized to operate a structural shapes and ornamental iron works. Joseph Kimelblatt, Marco A. Sisti and M. J. Ross, Lynbrook, N. Y., head the company.

The F. L. Smith Machine Co., New York, has leased the six-story and basement building, 75 x 92 ft., at 629-33 East Sixteenth Street, for a new establishment.

Mechanical Movements, Inc., New York, has been incorporated with a capital stock of $25,000 by U. G., G. F., and S. Oldham, West Brighton, Staten Island, to manufacture mechanical devices.

The Pathe Freres Phonograph Co., 18 East Forty-second Street, New York, manufacturer of talking machines, with plant at Brooklyn, has increased its capital stock from $2,500,000 to $4,000,000.

The Fastfeed Drill & Tool Corporation, New York, has been incorporated with an active capital of $575,000 by Joseph A. Nubel, John T. Herne, 61 Broadway, and Kenneth Kirk, 44 Whitehall Street, to manufacture drills, dies, tools, etc.

The Resta Motors, Inc., New York, has been incorporated with a capital stock of $25,000 by D. Resta, E. L. Smallwood and T. J. Whalen, 340 West Eighty-sixth Street, to manufacture motors for automobiles and boats.

The Marvin Stoker Co., Inc., New York, has been incorporated with a capital stock of $35,000 by C. H. Lyons, E. P. Morris and J. Marvin, Staten Island, to manufacture stokers, etc.

The Stromberg Carburetor Co. of America, 37 Wall Street, New York, has increased its active capital from $250,000 to $375,000.

The G. Danzis Co., New York, has been incorporated with a capital stock of $40,000 by F. O. Stolz, P. and G. Danzis, 2015 Grand Boulevard, to manufacture die-sinking equipment, etc.

The Simplex Metal Spinning & Stamping Co., New York, has been incorporated with a capital stock of $10,000 by S. Silverstein, L. M. Murray and D. D. Shapiro, 1541 President Street, Brooklyn, to manufacture electric fixtures, etc.

The Commodore Fastener & Tool Co., New York, has been incorporated with a capital stock of $50,000 by G. S. Scofield, W. H. Jackson and E. Flaig, 251 East Seventy-eighth Street, to manufacture mechanical specialties.

The Humil Corporation, New York, has been incorporated with a capital stock of $300,000 by J. Van Harder, H. H. Thurlow and F. D. Hagan, 55 Liberty Street, to manufacture electrical apparatus.

The Sterling Spinning & Stamping Works, New York, has been organized by B. Zinkin and I. Schlepp, 1161 Bryant Avenue, Bronx, to manufacture metal products.

The Eastern Garage, New York, has leased the building owned by the West Motor Co., on Avenue B near Nineteenth Street, for a service works and repair shop.

The Griffon Cutlery Works, 74 Fifth Avenue, New York, has purchased the 12-story building, 47 x 90 ft., at 151-53 West Nineteenth Street, for a new local establishment. Albert L. Silberstein is president.

The Kwikmix Mfg. Co., New York, has been incorporated with a capital stock of $210,000 by A. J. Meyerson, Theodore Levine and Matthew Black, 390 Putnam Avenue, Brooklyn, to manufacture beverage-mixing machinery, etc.

The Eagle Pencil Co., 703 East Thirteenth Street, New York, has filed plans for a five-story plant at 733-39 East Thirteenth Street, running through to Fourteenth Street, to cost about $200,000. Emil Berolzheimer is president.

The Wire Wheel Repair Co., 146 West Fifty-fifth Street, New York, has leased adjoining property for the enlargement of its plant.

Hardite Metals, Inc., New York, has been incorporated with a capital stock of $350,000 by I. B. and M. J. Rosencrantz, and M. H. Hoffman, 54 Lenox Avenue, to manufacture metal products.

Smith Brothers & Sklar, Inc., Brooklyn, has been incorporated with a capital of $20,000 by J. Sklar, M. and H. Smith, 136 Hall Street, to manufacture automobile bodies.

The New Toy Co., 143 Bleecker Street, Newark, N. J., manufacturer of mechanical toys, etc., has filed plans for a two-story plant at 219-25 Central Avenue, to cost about $108,000.

The M. & T. Machinery Co., Newark, N. J., manufacturer of automobile transmissions and machine parts, has leased property at 278 Washington Street for a new local establishment.

The Otto Heinemann Phonograph Supply Co., 25 West Forty-fifth Street, New York, manufacturer of talking machines, parts, etc., has awarded a contract to the American Concrete Steel Co., 31 Clinton Street, Newark, N. J., for its proposed four-story and basement reinforced-concrete plant at 146-70 Thomas Street, to cost about $140,000.

Amann & Finn, Inc., Newark, N. J., has been incorporated with a capital stock of $50,000 by E. F. Amann, Irvington, and D. J. Finn, New York, to manufacture motors, parts, etc.

The Newark Motor Products Mfg. Co., Newark, N. J., has been incorporated with a capital stock of $160 000 by Otto and H. J. Weber, and Albert J. Farmer, to manufacture motors and other electrical goods.

The Newark Millwright Co., Newark, N. J., has leased property at 28 Mechanic Street for a local establishment.

The Liberty Brass Foundry, 24 Thomas Street, Bloomfield, N. J., has filed notice of organization.

The Interstate Sheet Metal Works, 148 Mulberry Street, Newark, N. J., has filed notice of organization to manufacture piping and other sheet-metal products. Daniel Joseph, 36 West 118th Street, New York, heads the company.

The Universal Can Co., Binghamton, N. Y., has been incorporated with a capitalization of $1,000,000 by J. F. Montgomery, H. C. Hooks and B. E. Austin, 194 Rugby Road, Brooklyn, N. Y.

The Katterman & Mitchell Co., Port Jervis, N. Y., will erect a one-story factory, 62 x 126 ft., of reinforced concrete, on Cornell Street, Kingston, N. Y., at a cost of $70,000.

The Arrow Grip Mfg. Co., Glens Falls, N. Y., which recently increased its capital stock from $100,000 to $500,000, is arranging for the erection of a plant for the manufacture of automobile chains, etc.

The corporate style of the Electrolytic Oxy-Hydrogen Laboratories Co., 15 William Street, New York, has been changed to the Electric Labs Co.

The Hero Snap Fastener Co., Brooklyn, has been incorporated with a capital stock of $100,000 by S. Fink, L. Brockner and A. A. Hoffman, White Plains, N. Y.

The Sibley-Pitman Electric Corporation, 190 Sixth Avenue, New York, manufacturer of electrical products, has increased its capital from $150,000 to $250,000.

The Neptune Boiler & Machine Works, Brooklyn, has been incorporated with a capital stock of $50,000 by F. B. Johnson, J. C. Wilcox and M. J. McDade, 434 Forty-ninth Street.

A. P. Munning & Co., 50 Church Street, New York, manufacturers of metal products ,platers' supplies, etc., have awarded a contract to W. W. Patten, Matawan, N. J., for a one-story addition, 52 x 115 ft. and 52 x 62 ft., to cost about $35,000, including equipment.

The Simms Magneto Co., North Arlington Avenue, East Orange, N. J., manufacturer of magnetos, etc., has completed plans for a two-story reinforced concrete addition, 70 x 120 ft., to cost $75,000, including equipment.

The East Orange Radiator Co., 395 Central Avenue, East Orange, N. J., has filed notice of organization to manufacture automobile radiators and other metal products. Samuel Zuckerman, 522 South Nineteenth Street, heads the company.

The Overland Tire Co., 15 River Street, Newark, N. J., has awarded a contract to A. C. Windsor, 368 Sandford Avenue, for a new one-story plant, 144 x 240 ft., on Cortlandt Street, Belleville, N. J., to cost about $90,000, including equipment. John D. Olwell is president.

New England

BOSTON, Aug. 18.

There is considerable demand for machine tools, cranes, motors, and other equipment by those companies which are changing from war production to peace lines. Several agents of machine-tool manufacturers report that July was the busiest month for sales since the armistice. The Osgood-Bradley Car Co., Worcester, is buying heavily in small tools. It is making all bodies, front and rear axles of the 8-cylinder automobile now being made by the Standard Steel Car Co., and will continue to manufacture elevated, subway and surface street cars. The Compressed Steel Shafting Co., South Boston, will build a new plant on its present site and will need new equipment. The Northway Motor Corporation, Natick, Mass., maker of trucks, tractors and pleasure cars, is making a large increase in its capacity and is contemplating installing additional equipment. The Cutler-Hammer Co. sold a lifting magnet to the Perry, Buxton, Doane Co., South Boston. J. Lipsitz, Boston, scrap dealer, is inquiring for three cranes and three lifting magnets. The Nelson Blower & Furnace Co., South Boston, which has been making munitions, will specialize in farm tractors and will need new machine tools. The Mead-Morrison Mfg. Co., Boston, which made naval gun mounts, is building a new plant in Cambridge. The plants in Holyoke and East Cambridge of the Worthington Pump & Machinery Corporation have been purchasing new equipment.

The prophecy is freely made that machine tools will sell at higher prices than prevailed during the war. Costs have ascended sufficiently, the manufacturers state, to make certain that should they go any higher there must be a compensating change in the price lists. Of course, the great item is that of labor, a cost which is felt directly in the payroll, and almost as directly in the cost of material, supplies and equipment and, in a most emphatic way, of new construction. One of the material influences is that attending the general adoption of the 50-hr. week. In New England most of the machine-tool establishments have been operating on a 55-hr. week, and now one after another they are shortening their schedules to 50 hrs. Accompanying the reduction is an increase in wages in order that the earnings of employees may not be lessened, and the resultant increase in cost as distributed in the product is easily reckoned.

Revisions upward in price lists continue to be announced, and a very great part of machine-tool production is now on substantially the same basis as it was before the reduction. The next step will probably be to prices which heretofore never have been reached.

The manufacturers of planers continue to report increases in inquiries and orders. This is notably the case with the smaller sizes, but it is also the cases with the heavier planers, a condition which is a source of surprise, as they had not anticipated good business so soon after the slump which followed the armistice. Experience seems to vary among the builders of high-speed drilling machines. While some of the dealers report that the market is sluggish, some of the New England manufacturers who specialize in this type of tool state that they are doing a really good business, and this is another instance where the unexpected has happened. The feeling is that the Government-owned machine tools were disposed of in a manner which created a minimum of disturbance in the market, and this was not taken into account in considering the immediate future of the machinery business.

The dealers in mill supplies report a revolutionary change in their trade with the textile mills, which in New England constitute a buying power of great proportions. They have abandoned their old indifferent policy in the conduct of their plants, an indifference which extended to practically everything except textile machinery, and in not a few cases to this, also. One chief reason for the change is the high cost of labor of textile workers' as compared to what it used to be. Where it was very cheap as compared with most other industries, today it is on a par with any. Naturally the impulse is to make labor produce more. Another reason is the large profits which the industry is earning, which has resulted in the slogan "speed up to the limit." The extent to which this has been done is illustrated in the instance of a certain cylinder textile machine which before the war was 10 to 12 in. in diameter and ran eight or nine r.p.m. It is now 14 in. in diameter and runs at from 30 to 35 r.p.m. This ratio of greater speed is not at all uncommon. In consequence the usual obsolete old line shafting and hangers are being replaced by ball or roller bearings. Electric drive in sections or on individual machines is being installed for many thousands of machines. The larger textile mills maintain machine shops of their own, and once their equipment was not commendable. Today many of these shops are strictly modern, a result brought about by a desire to secure economical and quick repairs, and by the scarcity of the all-round machinist required for the work. The textile machine builders are good customers of the supply trade, as are the shoe manufacturers. The supply houses complain that prices of their goods are very high, in some cases extravagantly high, as in the case, for example, of lace leather for belting which has advanced from 25 cents to 90 cents and 95 cents per sq. ft.

The Worcester wire mills have reached a point of maximum tonnage, equaling the record achieved in the rush of war orders, according to reports made by the Worcester district of the American Steel & Wire Co., which includes the New Haven plant, and of the Clinton-Wright Wire Co., the combination of the Wright Wire Co., Morgan Spring Co., and Clinton Wire Cloth Co. In both instances most of the new business is domestic, but there is considerable foreign trade and the companies report a constantly increasing number of inquiries from all over the world, including the Far East and South America.

The Leland-Gifford Co., Worcester, Mass., manufacturer of drilling machines, lathes and profiling machines, will add two stories to one of its buildings, which will give considerable new floor space to be devoted to increasing the machine shops. This work was begun some time ago and dropped, and will now be carried to quick completion. The company is operating at normal capacity, and reports a rapidly growing demand for drilling machines of the high speed and heavy duty types.

The American Steel & Wire Co. will erect a building, 24 x 440 ft., at the North Works, Worcester, Mass., in which will be installed new electric galvanizing equipment.

The Coppus Engineering & Equipment Co., Worcester, Mass., manufacturer of steam turbines and blowers, will increase its brass foundry by a brick and steel extension, 55 x 240 ft., with monitor roof to permit of a traveling crane. Steele-Harvey furnaces and other equipment will be installed, and the capacity will be quadrupled. The company will increase its capital stock from $100,000 to $250,000 and some of the new shares will be set apart for purchase by employees under an easy payment plan.

The Efficiency Machine Tool Products Co., Bridgeport, Conn., has been incorporated with a capital of $25,000 by F. B. Carlson, Bridgeport; E. O. Goordman, Stratford; and A. E. Josefson, Providence, R. I., to manufacture machinery, tools, etc.

The Interlock Hardware Co., New Haven, Conn., has been incorporated with a capital of $150,000 by H. G. Voight and E. W. Sibley, New Haven; and L. B. Zacher, Branford, Conn., to manufacture hardware specialties.

The Holmes Special Tool Co., New Haven, Conn., has increased its capital stock from $25,000 to $50,000.

F. B. Markham & Co., Inc., New Haven, Conn., has been incorporated with a capital of $25,000 by F. B. Markham, H. A. Bettigole and A. F. Apsel, to manufacture automobile and motor truck parts, etc.

The Arrow Electric Co., Hartford, Conn., manufacturer of electrical products, has awarded a contract to the Porteous-Walker Co., Hartford, for a two-story addition, 50 x 200 ft., to cost $40,000.

The Crompton & Knowles Loom Works, Worcester, Mass., has awarded contract to the Aberthaw Construction Co., 27 School Street, Boston, for an additional foundry storage structure to cost $25,000.

The Cowan Truck Co., Holyoke, Mass., has awarded contract to the Casper Ranger Construction Co., Holyoke, for a two-story plant, 100 x 200 ft., to cost about $100,000.

The Pneumatic Scale Co., Norfolk Downs, Mass., has let contract to the Aberthaw Construction Co., 27 School Street, Boston, Mass., for a reinforced-concrete machine-shop addition, three stories, 27 x 38 ft., estimated to cost $75,000.

J. R. Montgomery & Co., Windsor Locks, Conn., manufacturers of meal, threads, etc., have closed bids for two factory buildings, 84 x 124 ft., two stories, and 84 x 100 ft., one story, of reinforced concrete.

The New England Iron Works, New Haven, Conn., is planning for the erection of a one-story shop, 60 x 150 ft., and office building on Dixwell Avenue.

The Davis Metal Stamping Co., Windham, Conn., has been incorporated with a capital of $50,000 by S. J. Davis, Riverside Park; C. J. Alpaugh, 230 Church Street, and W. P. Jordan, 228 North Street, to manufacture metal shingles and other metallic specialties.

The Dace Auto Wheel Equipment Co., Bridgeport, Conn., has filed notice of change of name to the Dace Rim Co.

The Osgood Bradley Car Co., Worcester, Mass., manufacturer of electric cars, has filed plans for the erection of a one-story addition on West Boylston Street, to cost about $14,000.

The Providence Boiler Co., Providence, R. I., has removed its plant from 296 Dover Street to 677 South Water Street, for increased operations.

The Phillips Time Switch Co., Huntington, Conn., has been incorporated with a capital of $50,000 by L. W. Holmes, C. F. Holmes and W. E. Fisher, all of Shelton, Conn., to manufacture electric time switches and kindred specialties.

The E. S. Stacy Supply Co., Springfield, Mass., has been incorporated with a capital of $250,000 by Alfred H. Chapin, Harry W. Stacy and J. M. Collins, to manufacture machine parts and other mechanical products.

The Peck & Young Mfg. Co., Forestville, Conn., manufacturer of springs, screw machine products, etc., has awarded a contract to the J. H. Grozier Co., 721 Main Street, Hartford, Conn., for the erection of a one-story factory, 60 x 200 ft., and a one-story boiler plant, 25 x 35 ft. The company recently increased its capital from $75,000 to $500,000. L. C. Humason is secretary and treasurer.

Robert J. Flynn, Inc., Hartford, Conn., has been incorporated with a capital of $50,000 by M. G., J. C. and Robert J. Flynn, 42 Washington Street, to manufacture automobile parts and other mechanical products.

The Narragansett Sheet Metal Works Co., 218 Chalkstone Street, Providence, R. I., has been organized to manufacture sheet metal specialties. David Jaffa, 370 Orms Street, and Abraham Nulman, 116 State Street, head the company.

The Connecticut Auto Sheet Metal Works, 105 Windsor Avenue, Hartford, Conn., has filed notice of organization to manufacture metal automobile products. Samuel Stone heads the company.

The Wells Hardware Co., Holyoke, Mass., has acquired two tracts of property on Main Street, between Cabot and Spring streets, and is said to be planning for the erection of a new factory.

The Alling Rubber Co., Bridgeport, Conn., has filed plans for the erection of a three-story addition to its plant on Middle Street, to cost about $15,000.

Charles S. Huth, 207 Barnum Avenue, Bridgeport, Conn., has awarded a contract to W. R. Phillips & Co., Bridgeport, for the erection of a one-story brick machine shop, 66 x 75 ft., on John Street, to cost about $13,000.

The Bridgeport Hardware Co., Bridgeport, Conn., has completed plans for the erection of a two-story addition, 20 x 150 ft., to a present structure on Iranistan Avenue.

The Connecticut Shock Absorber Co., Meriden, Conn., has filed notice of dissolution.

The Hanson-Whitney Machine Co., and not the Hanson-Whitney Mfg. Co., as announced in THE IRON AGE of July 24, is the corporate name of the new company organized at Hartford, Conn. to design and manufacture machines.

The manufacturing plant, real and personal, of the Bridgeport Tube Works, 250 North Avenue, Bridgeport, Conn., has been purchased by H. B. Houghton, of Asbury Park, N. J., for $17,400, assessed valuation being $13,092. The raw material and stock-in-process brought $9,796.98 by the pound. The machine tools, machinery, and mechanical equipment brought $26,020.05; the total sale aggregating $53,217.03. The principal purchasers were: The National Brass & Copper Co., Lisbon, Ohio; H. A. Staples, Plainfield, N. J.; J. H. Clausson Copper Works, Brooklyn; the Warren & Irrgang Co., Springfield; the Bristol Brass Corporation, Bristol, Conn.; the Randolph Clowes Co., Waterbury, Conn.; the N. Armstrong Co., New Haven; the Bridgeport Brass Co., Hunter & Havens, and J. L. Lucas & Sons, and Gledhill & Co., all of Bridgeport; the Westerly Brass Co., Westerly, R. I. J. E. Conant & Co., Lowell, Mass., were the auctioneers.

Buffalo

BUFFALO, Aug. 18.

Articles of incorporation have been filed by the Bilger Steel Products Corporation, Buffalo, having an authorized capital of $50,000. R. L. O'Brian, Marine Bank Building, D. Rochester and E. E. Finck are the incorporators.

The Willys-Morrow Co., Elmira, N. Y., is having plans for a foundry prepared by Mills, Rhines, Bellman & Nordhoff, Ohio Building, Toledo, Ohio. J. Edwin Morrow, Elmira, is secretary.

A plant for the manufacture of automobile and truck bodies is to be built at Waterloo, N. Y., by the Waterloo Wagon Co.

The Madison Tire & Rubber Co., Buffalo, N. Y., recently incorporated with an active capital of $2,600,000, will operate a plant at Buffalo for the manufacture of cord and pneumatic automobile tires, tubes, etc. The daily capacity will be about 1200 tires and 2000 tubes. It will acquire and continue the business of the United States Rubber Reclaiming Co., 724 Babcock Street, Buffalo. Rudolph A. Low is president.

The Iroquois Tool & Die Co., Buffalo, has been incorporated with a capital of $10,000 by George A. Gruber, Jr., Walter Preiss and William J. Wadner, to manufacture tools, dies, etc.

The Art Metal Co., Erie, Pa., is building a one-story addition, 120 x 166 ft., on Lohaal Avenue, to cost about $40,000.

The Hard Mfg. Co., 117 Tonawanda Street, Buffalo, manufacturer of iron and brass beds, has increased its capital stock from $150,000 to $250,000.

The Mighty Mfg. Co., Buffalo, has been incorporated with a capital stock of $50,000 by G. N. Chaltas, E. Pappas and E. L. Crabb, to manufacture electrical devices, etc.

The Clark-Robertson Vehicle Corporation, Buffalo, has been incorporated with a capital of $50,000 by Howard J. Clark, A. A. and N. E. Robertson, to manufacture wagons, parts, etc.

The American Tygard Engine Co., Buffalo, has been incorporated with a capital of $500,000 by J. G. Swartz, C. R. Rhoeder, Earl Smith, and A. G. Staller, to manufacture gas and gasoline engines.

The Falconer Iron Works, Falconer, N. Y., has commenced the erection of a two-story addition, 40 x 120 ft. A number of new machine tools will be installed.

The Defiance Check Writer Corporation, Rochester, N. Y., manufacturer of check protectors, has increased its capital stock from $350,000 to $450,000.

The Commercial Aeroplane Corporation, Buffalo, has been incorporated with a capital stock of $100,000 by Eugene N. Hickey, Glen W. Simpson and Robert R. Vance to manufacture aircraft and parts.

The Brown, Lipe, Chapin Co., 110 Seneca Street, Syracuse, N. Y., manuacturer of gears, automobile transmission, etc., is having plans prepared by G. L. Noble, Union Building, for a new five-story plant, 70 x 78 ft., at West Fayette and Ontario streets to cost $100,000.

The H. H. Franklin Mfg. Co., Syracuse, N. Y., has arranged for the immediate erection of the proposed addition to its plant at Marcellus and Magnolia streets, to consist of a seven-story works, 120 x 240 ft., to cost about $400,000, including machinery. It is proposed to increase the present output from about 11,200 a year to 18,000 automobiles a year. It is expected to have the new structure ready for occupancy early in December.

In connection with the annual Industrial Exposition at

Rochester, N. Y., to be held during the week of September 1-6, at Exposition Park, the following industrial concerns with local plants are arranging to make exhibits: Atlantic Stamping Co.; Brockway Motor Truck Co.; Galusha Stove Co.; Sill Stove Works; Co-operative Foundry Co.; General Railway Signal Co.; the Taylor Instrument Companies; Todd Protectograph Co.; and the Beers Thermostat & Electric Co.

The machinery installation to be made by the United States Hoffman Co., 329 Temple Street, Syracuse, N. Y., at the plant of the Van Wie Pump Co., 709-22 West Fayette Street, recently acquired, is estimated to cost about $20,000. The company specializes in the manufacture of pressing machinery and will use the structure for increased output. J. B. Spencer is general manager.

The Johnson Rim & Parts Co., Buffalo, capitalized at $50,000, has been incorporated to manufacture automobile parts, etc. L. D., H. R. and P. T. Large, 324 Goundry Street, North Tonawanda, are the incorporators.

The Harrison Radiator Corporation, Lockport, N. Y., has let contract to the John W. Cowper Co., Fidelity Building, Buffalo, for a reinforced-concrete addition, 38 x 160 ft.

The Foster Brothers Mfg. Co., 807 Broad Street, Syracuse, N. Y., is making alterations and additions to its factory building, 85 x 176 ft., four stories.

The Kellogg Mfg. Co., 3 Circle Street, Rochester, N. Y., manufacturer of air pumps, etc., has increased its capital from $75,000 to $300,000.

The Bilger Steel Products Corporation, Buffalo, has been incorporated with a capital stock of $50,000 by R. L. O'Brian, Delancey Rochester and Elmer E. Finck, 602 Ashland Avenue, Buffalo.

The Mey Chain Belt Co., 82 Washington Street, Buffalo, has filed notice of dissolution.

The O. K. Lock Co., Buffalo, has been incorporated with a capital stock of $5,000 by F. J. Offerman, J. F. Koebel and L. C. Wilkie, to manufacture locks, etc.

The Iroquois Utilities, Inc., Persia, N. Y., has made application to the Public Service Commission for permission to make improvements and extensions to its plants at Persia and Leon, Cattaraugus County, for increased capacity.

The McKim Foundry & Machine Co., Lockport, N. Y., has increased its capital stock from $50,000 to $100,000. The size of the plant is being increased by the addition of a practically new foundry, 100 x 200 ft., of brick and steel, at a cost of about $75,000 with equipment. Work has been started and contract for structural steel and iron work has been let to F. L. Heughes & Co., Inc., Rochester, N. Y. There will be no change of management.

Philadelphia

PHILADELPHIA, Aug. 18.

The Sharples Specialty Co., Philadelphia, has awarded a contract to Barclay White & Co., 1713 Sanson Street, for a one and two-story brick and steel plant, 75 x 180 ft., at Twenty-third and Westmoreland streets, to cost $65,000.

The Marlin Rockwell Corporation, 347 Madison Avenue, New York, has leased property at 4827-35 Brown Street, Philadelphia, 88 x 160 ft., for a local branch.

Patrick Grant, 113 Chestnut Street, Philadelphia, is having plans prepared for a two-story machine shop and automobile service works, 50 x 98 ft., at Marsden and Longshore streets, Tacony, to cost $40,000, equipped. E. Allen, Wilson, 1208 Chestnut Street, is the architect.

The Emergency Fleet Corporation, 140 North Broad Street, Philadelphia, has placed the Government wooden shipbuilding plant at Raymond, Wash., on the market, and is receiving bids for its purchase up to Sept. 10. The plant is about 11 miles from Willapa Harbor, and was operated by Sanderson & Porter, 52 William Street, New York, during the war. The sale will include machinery, tools and equipment.

The American Electric Storage Battery Co., Philadelphia, has been incorporated with capital of $1,000,000 by E. M. MacFarland and F. R. Hansell, Land Title Building, to manufacture storage batteries, etc.

James C. Hadik, 2434 North Fairhill Street, Philadelphia, has filed plans for a two-story brick addition to his machine shop, 18 x 30 ft.

The Philadelphia Drying Machinery Co., 3351 Stokley Street, Philadelphia, manufacturer of conditioning machinery, has filed plans for a one-story brick addition, 64 x 108 ft., to cost $22,000.

The Baldwin Locomotive Works, Broad and Spring Garden streets, Philadelphia, has filed plans for improvements and extensions in its shop at Sixteenth and Hamilton streets, to cost about $10,000.

Bromund & Son, Inc., Camden, N. J., has been incorporated with a capital stock of $50,000 by H. W. Bromund, Jr., J. Lambrecht and Francis J. Smith, 509 Federal Street, to manufacture electric lighting fixtures and appliances.

The MacAndrews & Forbes Co., Camden, N. J., manufacturer of wall board, etc., has awarded a contract to Barclay White & Co., 1713 Sansom Street, Philadelphia, for a one-story addition, 70 x 180 ft. The company recently increased its capital stock from $8,000,000 to $10,000,000.

The City Council, Gloucester City, N. J., has authorized a bond issue of $45,000 for extensions and betterments at the municipal pumping plant.

Charles W. Carll's Sons, 3 West Front Street, Trenton, N. J., manufacturers of sheet-metal products, have awarded a contract to James H. Morris, Broad Street Bank Building, for a new one-story factory on Stuyvesant Avenue, 46 x 149 ft.

Staple & Bell, Inc., Mears Building, Scranton, Pa., will build a new coal breaker at West Nanticoke, Pa., to cost about $100,000.

The Bonney Vise & Tool Works, Allentown, Pa., has filed plans for a one-story brick addition, 60 x 105 ft.

The Thermoid Rubber Co., Trenton, N. J., manufacturer of automobile tires, etc., has purchased property, 375 x 946 ft., on Whitehead road, near the plant of the Mercer Automobile Co., for a new works, estimated to cost about $300,000, including machinery.

The Keystone Screw Co., Seventeenth and Lehigh streets, Philadelphia, will make alterations at the plant of the Klauder-Welden Co., Yardley, Pa., recently acquired to accommodate it to its business. Walter F. Hagar, Jr., is secretary and treasurer.

The plant to be erected on Grantley Street, by Harry Read, York, Pa., will be used by the Read Machinery Co., of which he is president and treasurer. It will be one-story, 160 x 240 ft., divided into foundry, machine shop, etc., and is estimated to cost $60,000.

The Pennsylvania Collapsible Tube Co., Williamsport, Pa., has been incorporated with a capital stock of $25,000 by Harold A. Gilbert and associates, to manufacture tubing, etc.

The Autocar Co., Ardmore, Pa., manufacturer of motor trucks, has increased its capital stock from $2,000,000 to $10,000,000.

Baltimore

BALTIMORE, Aug. 18.

The Crown Cork & Seal Co., 1511 Guilford Avenue, Baltimore, has bought 100,000 sq. ft. of land adjoining its plant at Highlandtown, Baltimore. Otto G. Simonson is reported preparing plans for an addition to the plant. It is understood that the company plans to transfer to the new plant some of its work now carried on in Spain and Portugal. J. M. Hood, Jr., is president.

The Anodion Metal Co., Industrial Building, Baltimore, has leased a building at 124-126 South Street, and will equip it as a plant for the electroplating of electric fixtures. Motors and other machinery will be installed.

The Zell Motor Car Co., 11-15 East Mount Royal Avenue, Baltimore, has awarded a contract to the West Construction Co., for a three-story brick automobile repair shop, 61 x 75 ft., at 1300-1304 Lovegrove Alley, to cost $23,600.

The Emery Steel Co., 210 Garrison lane, Baltimore, has been incorporated with $25,000 capital stock by Lewis J. and J. C. Emery and Harry R. Harvey to manufacture iron, steel and other metals.

The Baltimore Car & Foundry Co., Curtis Bay, Baltimore, has purchased property adjoining its plant. No plans have been determined upon as yet.

The Locke Insulator Corporation of Maryland, Maryland Trust Building, Baltimore, has been organized to manufacture electrical transmissions, insulations and appliances, products, etc. Those interested are Donald Symington, W. Stuart Symington, Jr., and William Gilmor Hoffman.

Prices on single-head power bolt-threading machines, from ½ to 1¼-in., are wanted by J. M. Butler & Son, Suffolk, Va.

The following firms are prepared to receive quotations on boilers: Virginia Machinery & Well Co., Richmond, Va., 125 h.p., second-hand; Hackley Morrison, Richmond, Va., 350 h.p.; J. E. Britt, National Bank Building, Norfolk, Va., 20 h.p.; M. S. Moore, superintendent of lighting, Williamston, N. C., 150 to 250 h.p.; Ronda Cotton Mills, Ronda, N. C., and Sampson Power Co., Clinton, N. C., 150 h.p.

The C. Billups Sons Co., Norfolk, Va., manufacturer of plows, is planning to build a foundry to cost $60,000.

The Apex Motor & Machine Co., Apex, N. C., has been incorporated with $20,000 capital stock. J. A. Dean is one of the stockholders.

The Murray Auto & Parts Co., Atlanta, Ga., is planning to establish a plant for the manufacture of automobile bodies and sheet-metal parts.

Offenheimer Brothers, 413 North Howard street, Baltimore, manufacturers of refrigerators, has acquired the plant of the Montford Iron Works, and will use it for the manufacture of refrigerators.

The Frederick Engineering Co., Frederick, Md., has been incorporated to manufacture stokers and steam jet ash conveyors. Edwin Lundgren is general manager, and H. P. Childs, vice-president and sales manager.

The Continental Fiber Co., Newark, Del., has awarded a contract to the Austin Co., Cleveland, for a two-story plant addition, 60 x 240 ft., to cost $80,000.

The Bureau of Yards and Docks, Navy Department, Washington, is planning for the construction of a new pattern shop at the navy yard, Norfolk, Va.

The Oliver Rim Co., Atlanta, Ga., recently organized with a capital stock of $1,000,000, is planning for a new plant on a 14-acre site, recently acquired. The initial works will provide about 15,000 sq. ft. of manufacturing space, to be equipped for an output of about 500 rims per day. A second unit of like size and capacity is to be constructed at a later date. Elmer Oliver is president.

The James Iron Works, Rock Hill, S. C., recently organized, will establish an iron foundry. T. L. Johnson is president, and E. G. James, secretary.

The Baker County Power Co., Arlington, Ga., is planning for a new hydroelectric power plant on a site in Baker County, to cost with electric transmission system about $40,000. W. E. Saunders is president.

The Simmons Co., Kenosha, Wis., manufacturer of brass and metal beds, springs, etc., has acquired property at Atlanta, Ga., with building, 100 x 200 ft., and will establish a local branch plant for the manufacture of its specialties. An addition of like size will be erected at an early date, and other extensions and improvements made. The work is estimated to cost about $500,000.

The Liberty Shipbuilding Co., Wilmington, N. C., is planning for a new coaling plant to cost about $300,000. Lewis R. Ferguson is general manager.

Chicago

CHICAGO, Aug. 18.

A prominent dealer reports that business done in July was approximately 80 per cent of the total sales in representative war months and that during the first half of August 50 per cent more business was booked than in the corresponding period a month ago. This record is, however, not typical of the general situation among sellers. While some are maintaining or even exceeding the gait of a month ago, others find the market less active. Whether the falling off in orders is merely a temporary condition or portends a general decline in business is uncertain.

Among factors which are sources of increasing concern are delays in deliveries, an epidemic of strikes throughout this district and competition with Government tools. Cincinnati manufacturers of machine tools fear a strike will be called as a result of agitation for a closed shop. Government equipment is being pushed harder than heretofore, competition from this source being felt particularly in connection with inquiries for turret and engine lathes, automatic and hand screw machines. It is felt in some quarters, however, that the importance of this factor in the market has been overestimated. This view is based on the feeling that the red tape involved in the purchase of Government tools will in many cases, cause the prospective buyer to take new equipment, and on the report that the Government intends to reserve many tools for future emergencies. Another source of optimism is the prospect of large purchases of war tools by the Belgians. The representatives of a Belgian organization, known as the Construction Metallique, arrived in Chicago the latter part of last week and visited the Government's storage warehouse in the old Chicago Symington Corporation plant. The commission intends to purchase at least 2000 machines and may purchase even more, as the industries they represent need 60,000. The Belgians are in the United States for patriotic reasons. The Germans want to sell machinery to replace what they destroyed and the foreign exchange situation is such that Belgium could buy from its late enemy at much better advantage than from this country. However, in order to evade the heavy discount they would have to stand if they paid for American purchases immediately the Belgians hope to induce the United States Government to take three-year notes. This arrangement would enable them to start their factories, ship us goods, and restore exchange conditions to normal within a reasonable period. The Construction Metallique resembles the big holding companies of the United States. It will do all the buying for the Belgian manufacturers.

The automotive industry is foremost among recent purchasers in this territory. The Samson tractor plant of the General Motors Corporation, Janesville, Wis., has purchased its tool room equipment and will soon buy its production tools. The National Motor Car & Vehicle Corporation and the Stutz Motor Car Co., both of Indianapolis, Ind., have closed for miscellaneous equipment. In general, however, individual purchases are for one or two machines at a time. The demand for planers and boring mills is strong and punch presses are being sold in large numbers. A Harvey, Ind., company has purchased a 42-in. Bridgeford lathe. A manufacturer of planers recently sold a 30-in. open side machine to a Peruvian concern and two 30-in. and one 48-in. planer to a firm in Paris, France. There are no new lists of any size before the trade. The Chicago Board of Education is inquiring for a drilling machine and a grinder for the Spaulding School, and is considering the purchase of equipment for the Robert Lindblom High School. The Superintendent of Public Service of Cook County is in the market for an engine lathe, a drilling machine and a shaper.

Contracts have been awarded for the construction of a one-story plant on the southeast corner of Belmont Avenue and Knox Street for the Hill Pump Valve Co., Chicago, to cost $100,000.

Marshall & Fox, architects, Chicago, are taking bids on a three-story service station, 100 x 150 ft., to be built for the Cadillac Automobile Co., 2301 South Michigan Avenue, at a cost of about $100,000.

The Pollak Steel Co., 9757 Baltimore Avenue, South Chicago, Ill., has awarded contracts for the construction of a one-story foundry, 75 x 142 ft., to cost $12,000.

The Lasker Iron Works, 3201 South Lincoln Street, Chicago, has let contracts for the erection of a one-story boiler works, 100 x 186 and 96 ft., to cost $10,000.

The G. W. Davis Regulator Co., manufacturer of pressure reducing valves, 422-426 Milwaukee Avenue, Chicago, has let contracts for the construction of a one-story addition, 50 x 60 ft., to cost $8,000.

The Locomotive Crane Co. of America, 3609 South Ashland Avenue, Chicago, has been incorporated with $300,000 capital stock by Charles and Robert Vergan.

The Locomotive Lubricator Co., 6 North Michigan Avenue, Chicago, has been incorporated with a capital stock of $50,000 by W. J. Schleks and C. W. Rudolph.

The Pana Engine & Mfg. Co., Pana, Ill., has been incorporated with $50,000 capital stock to manufacture engines and machinery. The organizers include P. L. McKee, J. E. Jones and Julius Broehl.

The Western Clock Co., La Salle, Ill., has awarded a contract for the construction of an addition to have 33,000 sq. ft. of floor space.

The Duisdiker Foundry & Machine Co.'s plant, Peoria, Ill., was destroyed by fire recently.

The Western Structural & Machine Works, Peoria, Ill., has been incorporated by J. F. Sawhill, Clarence W. Heyl, Harry C. Heyl, and George J. S. Collins of that city and others. The company plans to build a $250 000 plant.

The Emerson-Brantingham Co., manufacturer of farm machinery, Rockford, Ill., has commenced the construction of a blacksmith shop and steel storage building, 80 x 192 ft., to cost $40,000. The company is also enlarging its wood shop.

The H. W. Johns-Manville Co., New York, has commenced excavating for a large plant at Waukegan, Ill.

The Wilson Foundry & Machine Co., Pontiac, Mich., has let contracts for three additions to its plant.

The Wilmarth Show Case Co., Grand Rapids, Mich., has awarded a contract for the addition of another story to its three-story plant. The estimated cost is $25,000.

The plant of the Larkin Tire & Rubber Co., Cherokee, Iowa, was recently destroyed by fire. The loss is estimated at $12,000.

The Iowa Gate Co., Cedar Falls, Iowa, has increased its capital stock from $120,000 to $400,000, and is planning the erection of an addition, 100 x 300 ft., for the manufacture of barn fixtures.

The Martin Co., manufacturer of seed corn dryers, cable lightning rods, etc., has purchased a tract, 88 x 132 ft., at 212-218 Third Street, Des Moines, Iowa. There is at present a small two-story brick structure on the property. The company has its present plant at Sac City, Iowa, but will move to Des Moines about Jan. 1.

The Zonta Tire & Rubber Co., Sioux City, Iowa, has been

incorporated with $1,500,000 capital stock to manufacture automobile tires, fire hose, heels and soles for shoes and other rubber accessories. A tract of land 200 x 400 ft. has been acquired near the Hawkeye Truck Co. plant, and this will be improved with a three-story brick factory, 100 x 150 ft. The officers are A. K. Kilborn, president; Hugh A. Ritchie, vice-president; H. W. Caldwell, secretary; T. P. Scott, treasurer.

George B. Limbert & Co., manufacturer of iron pipe and steam fitters' supplies, East Chicago, Ind., has awarded a contract for the construction of a two-story and basement structure, 52 x 82 ft., and a one-story building, 90 x 172 ft., to cost $80,000.

The Steinhart-Greiger Automobile Co., Terre Haute, Ind., plans to build a $100,000 plant at Seventh and Poplar streets unless the city park board decides to use the property for a playground.

The D. & M. Mfg. Co., Cambridge City, Ind., has leased a building at Eleventh and North E streets, Richmond, Ind., where it will do its manufacturing in the future. The company makes automobile engine piston rings.

The Ilg Electric Ventilating Co., 154 Whiting Street, Chicago, has had revised plans drawn for its proposed new plant at Crawford Avenue and George Street, to consist of a four-story factory, at an estimated cost of about $750,000, including machinery. Bids for the erection will soon be asked by A. S. Alschuler, architect, 28 East Jackson Boulevard. S. W. Weiss is president. The company specializes in the manufacture of electric blowers, fans, heating and ventilating apparatus.

The Hill Pump Valve Co., 2307 Archer Avenue, Chicago, has awarded a contract to Stressenreuter Brothers, 3020 South Halsted Street, for the construction of its proposed one-story plant, 213 x 256 ft., at 4001-21 Belmont avenue, to cost $100,000, including machinery.

The International Harvester Co., Chicago, has acquired property, 297 x 674 ft., at Ninety-ninth street and Muskegon avenue, for about $12,000. The site adjoins the Wisconsin Steel Co. plant of the International Harvester works.

The Wahl Co., 1800 North Roscoe Street, Chicago, manufacturer of adding machines, has had plans prepared by B. H. Prack, architect, Keystone Building, Pittsburgh, for the erection of a five-story plant, 125 x 150 ft., to cost about $225,000. The company has increased its capital from $2,600,000 to $18,500,000.

The Zonta Tire & Rubber Co., Kansas City, Mo., is having plans prepared for a three-story plant, 200 x 300 ft., on the Floyd River Road, Sioux City, Iowa. A. H. Kilborn is president.

The Economy Machine Products Co., 4755 London Avenue, Chicago, manufacturer of screws, tacks and similar specialties, is planning for the erection of new works on Lawrence street, 160 x 200 ft., to cost about $100,000, including equipment.

The Van Sicklen Speedometer Co., Chicago, has increased its capital from $250,000 to $2,500,000. Officials of the Elgin National Watch Co. are interested in the company and the manufacturing is now being conducted in a section of this plant at Elgin, Ill. It is proposed to erect a building for the exclusive manufacture of speedometers later. N. H. Van Sicklen, Sr., is president.

T. J. Barnes, Pittsburg, Kan., has broken ground for a new plant, 50 x 80 ft., at 104 Locust Street, to be equipped for the manufacture of automobile bodies, with machine shop for repair work. The works will cost about $70,000, including machinery.

The Salvage Division, Rock Island Arsenal, Rock Island, Ill., has advertised a sale of Government spindle drill presses, turning lathes, jack frames, cutting off machines, engine lathes, buffing lathes, post drill presses and wood lathes.

Pittsburgh

PITTSBURGH, Aug. 18.

The Duquesne Light Co., Pittsburgh, has perfected plans for the immediate erection of its proposed electric generating plant at Cheswick to cost about $15,000,000, including equipment. The new plant will be designed for a total capacity of 120,000 kw., with initial installation to aggregate 60,000 kw. The company will operate its own coal mines in connection with the new station, these being located about 2 miles from the plant site, which is on the Allegheny River. A. W. Thompson is president.

The Pittsburgh Metallurgical Co., Pittsburgh, has increased its capital from $50,000 to $250,000.

The Slick-Knox Steel Co., Sharon, Pa., is planning for a new two-story assembling plant, 150 x 300 ft., at its works at Wheatland, Pa. C. K. Straubaugh is president.

The Atlas Tire Co., Pittsburgh, has been incorporated with capital stock of $100,00 by W. C. Hildebrand and C. C. Medara, Pittsburgh; and H. E. Harper, Zelimple, Pa.

The City Council, Grove City, Pa., is having plans prepared for an addition to the municipal electric lighting plant to cost about $50,000. Sidney B. Martin, Penn Building, Pittsburgh, is the engineer.

The Kruk Percussion Fuse Co., Pittsburgh, has been incorporated with a capital stock of $50,000 by Stanley Kruk and Jacob Molek, Clymer, Pa.; and A. M. Oliver, St. Nicholas Building, Pittsburgh, to manufacture fuses, etc.

The Bessemer Gas Engine Co., 200 Thomas Avenue, Grove City, Pa., is considering the erection of an addition.

The American Conduit Mfg. Co., New Kensington, Pa., manufacturer of electrical conduits, has increased its capital stock from $540,000 to $600,000.

Fire, Aug. 11, at the plant of the Miller-Owen Electric Co., Lexington Avenue and Thomas Boulevard, Pittsburgh, caused a loss of about $50,000, including loss of dynamos and motors.

The United States Stamping Co., Moundsville, W. Va., manufacturer of metal specialties, has arranged for a new reinforced concrete plant to cost about $75,000, including equipment. J. M. Sanders is president.

The Parkersburg Rig & Reel Co., Parkersburg, W. Va., has completed plans for a one-story foundry, 100 x 220 ft., to cost $100,000, with equipment. Day & Zimmerman, 611 Chestnut Street, Philadelphia, are the engineers. John Crawford is president.

The Wilcox Machine Co., Wheeling, W. Va., incorporated with a capital stock of $300,000, is considering the erection of a works at Shadyside, vicinity of Bellaire, Ohio. Edward Stifel, J. C. McKinley and H. C. Ogden, all of Wheeling, are stockholders.

The Winding Gulf Colliery Co., Winding Gulf, W. Va., is planning for the installation of new equipment at its power plant for increased capacity, to include boiler, generator, etc.

The Cutright-Sharps Co., Buckhannon, W. Va., recently organized with a capital stock of $75,000, to manufacture metal shade-rollers, fixtures, etc., is planning to erect a plant. A site is now being selected. I. G. Cutright is president, and J. A. Sharps is manager.

Indianapolis

INDIANAPOLIS, Aug. 18.

The Inland Motor Truck Co., Evansville, Ind., has been incorporated with $250,000 capital stock to manufacture motor vehicles. The promoters are Elmer Q. Lockyear and Henry J. Graf.

The Auburn Mfg. Co., Auburn, Ind., has increased its capital stock $20,000.

The Evans Tire & Reliner Co., Ft. Wayne, Ind., has been incorporated with $100,000 capital stock to manufacture auto tires and tubes. The directors are Richard I. Evans, Louis E. Ridgeway and Robert O. Beecroft.

The Tekheim Oil Tank & Pump Co., Ft. Wayne, Ind., has increased its capital stock from $200,000 to $400,000.

The Haynes Automobile Co., Kokomo, Ind., has let the contract for an addition to its plant to cost $600,000.

The United Engineering Co., Greensburg, Ind., recently organized, has awarded the contract for its factory building to cost $22,000. It will manufacture automobiles.

Milwaukee

MILWAUKEE, Aug. 18.

New business booked by local machine-tool builders, especially makers of milling machines, continues to broaden, although large lots are absent. Orders for single tools or a few machines at a time, however, comprise a very satisfactory volume and the prospects for new business are regarded as much more promising than a few months ago.

Structural fabricators have booked a considerable lot of business which will keep shops busy for at least three or four months. There are only a few big requirements, but an unusual number of small and medium-sized jobs involving principally the lighter sections.

Ruston & Hornsby, Ltd., Lincoln, England, has perfected arrangements with the Wallis Tractor Co., Racine, Wis., to

manufacture the Wallis tractor in Great Britain. T. P. N. Burness is managing director of the British company.

The E. & W. Mfg. Co., 325-335 Oregon Street, Milwaukee, has let contracts for a two-story addition, 50 x 85 ft. It manufactures motor truck units for application to automobile chasses. A small list of tool equipment is being purchased. George E. Williams is secretary and treasurer.

The Appleton Machine Co., Appleton, Wis., is erecting a brick and steel machine shop addition, 30 x 100 ft., to provide facilities for making larger types of special machinery for paper and pulp mills. H. E. Saecker is president.

The American Plywood Co., New London, Wis., has been incorporated with a capital stock of $200,000 and will start work immediately on the erection of a new factory and power house, including a main shop, 80 x 420 ft.; a veneer cutting mill, 70 x 70 ft., and offices, shipping room, etc., estimated to cost $150,000 with equipment. The moving spirit in the enterprise is Frank L. Zaug, who has resigned as vice-president and general manager Wisconsin Cabinet & Panel Co., New London. Other members of the new concern are stockholders in the Belber Trunk & Bag Co., Philadelphia.

The Lederer Machine Co., Milwaukee, has been incorporated with a capital stock of $30,000 by I. Lederer, T. B. Hirsch, E. L. Kaumheimer and G. E. Katzenstein, to manufacture special machinery and devices.

The Conradson Machine Tool Co., Green Bay, Wis., expects to place its new works in full operation by Sept. 1. The company was formed last spring with a capital stock of $300,000 to take over and develop the machine tool manufacturing business of C. M. Conradson, who is vice-president and general manager of the new corporation. Between $200,000 and $225,000 is being expended in remodeling and enlarging an existing shop group and installing new machinery. The initial working force will number 275.

The Vulcan Mfg. Co., Fond du Lac, Wis., is contemplating the erection of a brick and steel shop addition, 50 x 150 ft., costing about $25,000, early in the fall. It conducts a general iron works.

The West Bend Barn Equipment Co., West Bend, Wis., has purchased the business and equipment of the Spring Bearing Truck Co., Waupaca, Wis., and is consolidating at West Bend. Tentative plans are being prepared for a one-story shop addition to increase the capacity 50 per cent. The new truck line is a heavy duty vehicle for industrial plants, railroads, etc.

The Electric Carpet Washer Co., Milwaukee, has been incorporated with a capital stock of $25,000 by J. A. Barry, E. G. Patek and John F. Bluemm to manufacture special electric-motored machines.

The Moe-Bridges Co., 60-64 Third Street, Milwaukee, manufacturer of gas and electric fixtures, has increased its capital stock from $20,000 to $40,000 and will increase its output approximately 100 per cent. Henrik Moe is president.

The Stoughton Wagon Co., Stoughton, Wis., which is erecting an addition, will engage in the manufacture of motor trucks, largely as an assembling concern. Some new tool equipment is being purchased. The trucks will be made in 1½, 2 and 2½-ton capacities. F. J. Vea is president.

The Standard Steel Corporation, Milwaukee, has awarded contracts for the erection of its new works at Calhoun Place and the Milwaukee road tracks, near Chambers Street, consisting of a machine shop and assembling floor, 120 x 150 ft., brick and steel, with metal sash.

The Collins Land & Lumber Co., Madison, Wis., has engaged engineers to design a new sawmill to replace the plant at Rapid River, Mich., recently destroyed by fire. A 25 per cent increase in capacity is planned. The investment will be about $65,000. W. H. Collins, Madison, is president.

The Ripon Toy Corporation, Ripon, Wis., has been organized with a capital stock of $150,000 to take over the Kangaroo Toy Co., Chicago, which is transferring its headquarters to Ripon. Plans are being prepared for a two-story factory, 60 x 150 ft., to be ready Nov. 1. The company will specialize in electrical and mechanical toys. W. R. Keen, Chicago; E. J. Burnside, R. S. Stuart, E. W. Barnes and A. B. Carter, Ripon, are the directors.

The Board of Education, Janesville, Wis., has engaged Van Ryn & DeGelleke, architects, Caswell Block, Milwaukee, to prepare plans for a high and vocational training school, 183 x 190 ft., with a separate boiler and power house, 40 x 65 ft. Bids will be taken about Sept. 10.

The Rex Typewriter Co., Fon du Lac, Wis., will install some new equipment for the purpose of adding a department for the manufacture of a head-lamp controller for motor vehicles.

St. Louis

ST. LOUIS, Aug. 18.

The Parker-Russell Mining & Mfg. Co., St. Louis, will equip a two-story brick factory.

The Hill City Compress Co., Vicksburg, Miss., T. W. McCoy, Alex Fitzhugh and others interested, have plans for the establishment of a $125,000 compressing plant.

The Marvell Light & Ice Co., Marvell, Ark., V. F. Newmann, president, will install a 200-hp. oil engine and a 20-ton ice making plant.

The Sulphur Ice, Light & Power Co., Sulphur, Okla., will install about $30,000 worth of machinery. Paul G. Katie can be addressed.

The Pelican Well Tool & Supply Co., Shreveport, La., will equip two machine shop units, forge and pipe shops.

The Ahrens & Ott Mfg. Co., St. Louis branch, J. D. Senden secretary, will erect a six-story plant for the manufacture of plumbing supplies.

The Great Southern Producing & Refining Co., Shreveport, La., W. T. Peacock, Indianapolis, Ind., president, will establish an oil refinery with a daily capacity of 1000 bbl. and an ultimate capacity of 15,000 bbl.

J. W. Boyer & Co., Corinth, Miss., will install equipment for a cold storage plant to cost about $75,000.

The Groblebe Lumber Co., C. I. Groblebe president, St. Joseph, Mo., will install a mill at Morrilton, Ark., with an annual capacity of 6,000,000 ft.

The H. & H. Machine Co., St. Louis, will equip an addition for grinding and regrinding cylinders for internal combustion engines.

The Crowley Motor Co., Crowley, La., will equip a machine and repair shop at a cost of about $20,000.

Contract for the erection of the plant of the General Motors Corporation, Natural Bridge and Union Street, St. Louis, has been let to the George A. Fuller Construction Co. and work will commence at once on three buildings to cost $2,000,000, including equipment. The plant will employ 8000 men eventually.

The Rhodes Metallic Packing Co., Shreveport, La., has increased its capital to $75,000.

The J. H. Miner Saw Mfg. Co., Shreveport, La., is planning for the erection of a new one-story works to cost about $15,000. J. H. Miner, Lumberton, Miss., is president.

The Farm Implement Mfg. Co., Cedar Grove, La., recently incorporated with a capital of $1,000,000, has secured a 10-acre site and is planning for the erection of a plant. A. B. Pickett is manager.

Cincinnati

CINCINNATI, Aug. 18.

Recent foreign orders include a large number of portable electric drilling machines for shipment to Spain and a few orders for machine tools have been received through exporters. Within the past week some business has also come from England and France. Communications have been received from Germany asking for the re-establishing of former business relations. A great deal of interest is taken in prospective business from the Scandinavian countries and firms not already represented are taking steps to secure a share of this trade.

Manufacturers of engineering specialties were never busier and only a comparatively small part of their output is for the Government. Export orders contribute in no small measure to the activity of these firms.

A tabulation of production costs for the month of July shows a considerable increase with all manufacturers. The hot weather during that month is given as one cause for a comparative decreased output and an incidental increased cost of production. The mounting cost of raw materials is also an important factor.

The Modern Foundry Co., Oakley, Cincinnati, has had plans prepared for a four-story pattern shop addition, 60 x 160 ft. Walter A. Geier is general manager.

Contract has been awarded for the addition to the plant of the Acme Machine Tool Co., Winton Place, Cincinnati. R. A. Jones is general manager.

The United States Cast Iron Pipe & Foundry Co., Addyston, Ohio, has awarded contract to the Chicago Foundation Co., Chicago, for a machine shop addition.

The National Jack Co., Cincinnati, will be incorporated with $50,000 capital stock by George H. Fredericks, Harrison, Ohio, and others. It has leased space in the Power Building, Cincinnati, and will manufacture automobile jacks.

The Dalton Adding Machine Co., Norwood, Cincinnati, has awarded contract to the Ferro Concrete Construction Co., Cincinnati, for an addition, 60 x 160 ft., four stories.

The Long & Allstatter Co., Hamilton, Ohio, has had plans prepared for an addition to its machine shop. F. P. Long is president.

The Doron Brothers Electrical Co., Hamilton, Ohio, maker of electrical equipment and screw machine parts, will erect a plant 30 x 100 ft., two stories.

The National Cash Register Co., Dayton, Ohio, has announced plans for the construction of additions to its plant estimated to cost $1,000,000.

The Marshall-Smith Tool Co., Dayton, has been incorporated with $10,000 capital stock by F. L. Smith, J. L. Marshall and others.

The Avon Tool & Machine Co., Dayton, has been incorporated with $20,000 capital stock by Anthony R. Cooper and others. It is reported that the company will engage in a general tool-making and machinery business.

The Monitor Motor Car Co., Columbus, Ohio, has purchased the plant formerly occupied by the Scioto Rubber Co., and will equip it for the manufacture of motor cars. The works on Cleveland Avenue will be kept in operation until the new building is ready for occupancy.

The American Radiator Co., Springfield, Ohio, has obtained a permit for an addition to its plant estimated to cost $20,000.

An ice-manufacturing and cold storage plant to cost about $500,000, including equipment, will be erected by the Frank Fehr Ice & Cold Storage Co., Louisville. It will be of reinforced concrete, 150 x 500 ft., and will have a capacity of about 130 tons of ice per day.

The Southern Pipe & Foundry Co., Knoxville, Tenn., recently incorporated with a capital of $75,000, is planning for the erection of a new machine shop. F. S. Mead heads the company.

The William C. Krauth Electrical Co., 113 West Market Street, Louisville, Ky., is planning for the erection of an addition to its plant which with machinery will cost about $25,000. William C. Krauth is president.

Detroit

DETROIT, Aug. 18.

At the rate local building permits are being taken out, it is believed the month will be one of the largest the city has experienced in a number of years. Permits for the erection of four factory buildings appear on the list for the week and includes a six-story steel and concrete unit for the Fisher Body Corporation, four-story reinforced concrete building for the Liberty Starter Co., two-story steel and brick structure for the Gear Grinding Machine Co., and a steel building for the Peninsular Brass Works.

The A. J. Detlaff Co., Detroit, manufacturer of Bull Dog clutches for automobiles, has purchased six acres in Sandwich, Ont., as a factory site.

The Blackmer Pump Co., Petoskey, Mich., has completed plans for an addition to the main factory. A foundry, 75 x 100 ft., will also be erected.

The Jackson Motor & Mfg. Co., Jackson, Mich., and the United Four Wheel Drive Truck Corporation, Chicago and Port Jefferson, L. I., have been merged under the name of the Jackson Motors Corporation, with a capital stock of $5,000,000. H. A. Matthews has been elected president; W. W. Sterling, Boston, vice-president; Carl L. V. Exselsen, Chicago, attorney and president Portage Silica Products Co., Portage, Wis., secretary; and F. O. Evans, president Evans Art Piano Co., Chicago, treasurer. Besides the officers, the board of directors includes C. O. Minger, president Electric Auto Light Co., and a vice-president of Willys-Overland, Inc.; F. E. Mosher, secretary and general manager Covert Gear Co., Lockport, N. Y.; Chrispon Oglebay, president and general manager Ferry Machine & Foundry Co., Cleveland; G. W. Rogers, Goodyear Tire & Rubber Co., Akron, Ohio; and F. C. Matthews, formerly superintendent and secretary Jackson Motor & Mfg. Co. The new concern soon will increase its working force to 1000.

The York Brothers Sheet Metal Works, 313 Franklin Street, Detroit, is taking bids for the erection of a one-story plant, 105 x 270 ft., at Beaufait and Mack avenues, to cost about $75,000, including equipment.

The Hudson Motor Car Co., Jefferson street, Detroit, is having plans drawn for a one-story addition, reinforced concrete, 300 x 300 ft., to cost, with machinery about $325,000.

The Ruhl Malleable Iron Co., Adair Street, Detroit, is taking bids for the construction of a one-story addition, 144 x 232 ft., to cost about $35,000. S. A. Commins is secretary.

The Keller Pneumatic Tool Co., Fulton Street, Grand Haven, Mich., is considering the erection of a one-story, brick addition, 100 x 180 ft. W. H. Keller is general manager.

The Standard Parts Co., Cleveland, Ohio, will build a one-story addition to its plant at Pontiac, Mich., 100 x 150 ft.

The Board of Water Commissioners, Detroit, is having plans drawn for a new one and one-half story boiler plant, 65 x 153 ft., to be used in connection with the municipal waterworks. With equipment it will cost about $250,000.

California

LOS ANGELES, Aug. 12.

The Madsen Iron Works, Sixteenth Street and Santa Fe Avenue, Los Angeles, operating a general foundry, pattern and machine shop, with the manufacture of steel ranges and other products, has acquired about five acres at Vernon as a site for a new group of buildings. P. and M. Madsen head the company.

The Martin Current Motor Co., Los Angeles, has been incorporated with a capital stock of $100,000 by Charles F. Dearborn, Harry H. Holden and J. B. Dudley to manufacture water motors.

The Batteryguard Mfg. Co., Los Angeles, has been incorporated with a capital of $75,000 by J. F. Andres, 1151 West Fifty-second Street, Los Angeles; Paul P. Jones and A. S. Churton, 410 West Elk Avenue, Glendale, Cal., to manufacture storage batteries and thermostatic controls.

The Washburn-Walker Co., Los Angeles, has been incorporated with a capital of $25,000 by D. M. Washburn, D. L. Carter and Rene Legoube, to manufacture batteries.

The Modern Iron Works, Los Angeles, has filed notice of organization to manufacture iron and steel specialties. William Koch, 3434 Percy Street, and William F. Haase, 2641 Pomeroy Street, head the company.

The Long Beach Sash & Door Co., Long Beach, Cal., is considering the erection of a new plant at Anaheim Street and Euclid Avenue, to cost about $100,000, including equipment. It has a site about 250 x 330 ft.

The Warnerlite Co., Davenport, Iowa, has completed negotiations with the city officials, Pasadena, Cal., for lease of a site, 318 x 505 ft., at Willis Street and Marengo Avenue, for the erection of a plant to manufacture automobile lighting appliances and agrees to erect a factory to cost not less than $100,000, including equipment. W. F. Warner, head of the company, is a resident of Pasadena.

To provide for the construction of its proposed new plant at Ascot Park, near Los Angeles, at an estimated cost of about $4,000,000, the Goodyear Tire & Rubber Co., Akron, Ohio, has incorporated the Goodyear Tire & Rubber Co., of California, Los Angeles, with a capital stock of $20,000,000. The directors are Harry Chandler, J. C. Drake, Lee A. Phillips and J. F. Sartori. Hunt & Burns, Laughlin Building, are the architects.

The Pacific Copper & Brass Co., Los Angeles, has awarded a contract to H. G. Grimwood, 748 West Seventh Street, for the construction of a one-story brick building, 100 x 150 ft., at Seventh and Mateo streets.

The Swingspout Measure Co., Los Angeles, has been incorporated with a capital of $30,000 by H. D. Rives, Scott E. Allen and Frank Carroll, to manufacture metal measuring devices and other specialties.

Hamilton Forline, Los Angeles, is organizing a company to build and operate a shipyard at San Diego. The City Council has granted a lease on the tidelands for the plant, comprising a site of about 14 acres.

The Transport Body Co., 641 Santa Fe Avenue, Los Angeles, manufacturer of automobile bodies, has had plans prepared for the erection of a new one-story plant, 140 x 220 ft., at Santa Fe Avenue and Porter Street.

Canada

TORONTO, Aug. 18.

Bids will be received until Aug. 30 for the erection of two factories for the Dupre Iron Works, Ltd., care of P. L. W. Dupre, architect, 15 St. Lawrence Boulevard, Montreal, to cost $75,000.

Bids will be called at an early date for the erection of a machine shop for Bruce Stewart & Co., Ltd., Great George street, Charlottetown, P. E. I. C. B. Chappell & Hunter, Des Brisay Block, are the architects.

D. G. Loomis & Sons, 357 St. Catharine street West, Montreal, have been awarded the general contract for the erection of two factories at Longue Pointe, Que., for the

Montreal Locomotive Works, Ltd., 145 St. James street, Montreal.

Contracts have been let for the erection of a plant at Oshawa, Ont., for the Gananoque Spring & Axle Co., to cost $200,000.

The International Malleable Iron Co., Guelph, Ont., is making arrangements for the erection of a new machine shop, one-story, 120 x 189 ft., and has had plans prepared by W. A. Malone. It will be of concrete and brick and cost $33,000.

The Krug Brothers Co., Ltd., Chesley, Ont., is in the market for a 100 hp. boiler, double riveted, double butt strapped.

William and J. G. Gray will erect a factory at the corner of Esplanade and Church street, Toronto, Ont., to build cranes. It will cost $50,000.

Ernest Cormier, 10 Cathcart street, Montreal, architect and engineer, has been awarded the general contract for the construction of a powerhouse for the Sisters of the Congregation of Notre Dame, Montreal, and is in the market for one 5-kw. generator, two steam engines, storage batteries, boilers, pumps and electric motors.

An explosion followed by fire completely wrecked the Government elevator at Port Colborne, Ont., Aug. 9, causing a loss of upward of $1,000,000. It was operated by electricity and had a capacity of 2,000,000 bu. J. A. Jamieson, architect, states that the work of rebuilding will be started immediately.

The Gregory Tire & Rubber Co., Vancouver, B. C., recently formed with a capital stock of $1,500,000, has secured two and one-half acres at East Collingwood, South Vancouver, and will start work at once on the erection of a plant which, when completed, will have a daily capacity of 600 tires and 1000 inner tubes. It will manufacture rubber by a special process the patentee of which is Morton Gregory of Tacoma. J. A. Cunningham, Vancouver, is interested in the undertaking.

The George B. Meadows Co., Ltd., 479 Wellington street West, Toronto, is in the market for 6 or 8-ft. gap or squaring shear.

The Canadian Vickers, Ltd., Montreal, is in the market for one double-end punching machine to punch 1-in. hole through 1-in. plate, throat about 30-in; also one punch and shear, punch of above dimensions, shear with 20-in. gap, both for electrical drive.

Burnett & Crampton, Rigaud, Que., are having plans prepared for the rection of a foundry to have a capacity of 250 tons of castings per month. New equipment will be installed.

The Orillia Tractors, Ltd., Orillia, Ont., has been incorporated with a capital stock of $300,000 by Frederick W. Vollans, James B. Tudhope, William H. Tudhope and others to manufacture tractors, motor vehicles, farm implements, etc.

The Roberts Automatic Connector Co., Ltd., Sarnia, Ont., has been incorporated with a capital stock of $1,000,000 by John W. Roberts, John Garroch, Thomas H. Robinson and others to manufacture automatic connectors, railroad appliances, machinery, etc.

The Sunshine Lamp & Supply Co., Ltd., Montreal, has been incorporated with a capital stock of $20,000 by Charles S. G. Ogden, Charles S. LeMesurier, John L. Reay and others to manufacture lamps, appliances, machinery, etc.

J. H. Connor & Son, Ltd., Ottawa, Ont., has been incorporated with a capital stock of $300,000 by Ainslie W. Greene, William H. Johnston, Bertha A. Cowan and others to take over the business and plant of J. H. Connor & Son, Ltd., to manufacture machinery, factory equipment, etc.

The Bramsons Auto Service, Ltd., Montreal, has been incorporated with a capital stock of $400,000 by Henry Weinfield, Marcus M. Sperber, Sarah Miller and others to manufacture and repair automobiles, motor trucks, tractors, etc.

The Excelsior Electric Dairy Machinery, Ltd., Toronto, has been incorporated with a capital stock of $100,000 by Lewis T. Rutledge, 320 Concord Avenue; William W. Baldwin, Alfred N. Morine, 156 Yonge Street, and others, to manufacture electric motors, electric machinery, dairy machinery, fine tools, etc.

The Ross Can Co., Ltd., Bowmanville, Ont., has been incorporated with a capital stock of $500,000 by Frank Regan, Room 508, 12 Richmond Street East; Alexander Nugent, Edward Murphy and others, to manufacture containers, etc.

The Electric Materials & Products Co., Ltd., Toronto, has been incorporated with a capital stock of $50,000 by John Downs and Orlando C. Glover, both of Hamilton, Ont.; Charles A. Holyoake of Toronto and others to manufacture electric fans, irons, heaters, radiators, sockets, plugs, etc.

The Pacific Northwest

SEATTLE, Aug. 12.

General business conditions continue good with considerable activity in manufacturing lines and an unusual amount of building of all kinds under way.

Labor troubles continue in Seattle shipyards. At the plant of the Skinner & Eddy Corporation, a strike has been temporarily averted by a decision to leave wage problems to the International Metal Trades union heads. The demand for machinists and skilled mechanics is not so heavy at present, although the labor turn-over is large. Common or unskilled labor is in great demand with the supply insufficient.

The mill and lumber yard of the Bissell Lumber Co., The Meadows, near Seattle, were completely destroyed in a recent fire with a loss estimated at $200,000. The plant had a daily capacity of 100,000 ft.

The Crater Lake Box Co., Klamath Falls, Ore., recently incorporated, has taken over the holdings of the Bray Lumber & Box Co., and increased its capital stock from $60,000 to $100,000. The new capital will be used in improvements and extensions.

The American Diato Co., Portland, Ore., has been incorporated with $200,000 capital stock by M. E. Newton, A. D. Frost and W. H. McMonies to manufacture mining machinery.

The Clarke Lumber & Mfg. Co., Vancouver, Wash., has completed plans for its factory, to cost about $50,000.

The St. Helens Lumber Co., St. Helens, Ore., is making improvements which will increase its daily capacity to 200,000 ft., and cost more than $50,000. A new bandsaw and edger will be installed.

A. E. Adelsperger and W. J. Conrad, of Marshfield, Ore., will erect a sawmill adjoining the plant of the Coos Bay Shipbuilding Co., which will have a daily capacity of 100,000 ft., and cost $150,000.

The Willamette Iron & Steel Works, Portland, has been reorganized by Morton H. Insley, secretary, under the name of the Willamette Iron & Steel Works Realty Co, to extend activities to deal in real estate surrounding the plant.

The Reed Engineering Co., Vancouver, Wash., recently incorporated by Merrill A. Reed and associates, has taken over the properties and business of the Motorship Construction Co., and will make improvements and extensions. Several new lines of manufacture will be added, including the building of canoes.

The Naches Cold Storage Co., Yakima, Wash., has purchased the sawmill and box factory of the Pine Box & Lumber Co. for a consideration of $80,000. It will be enlarged to have a capacity of 40,000 boxes.

The Medford Aircraft Co., Salem, Ore., has been incorporated with $10,000 capital stock, by F. P. Farrell, Seeley Hall and Floyd Hart, to manufacture airplanes.

J. H. Weaver and W. J. Stratford, Eugene, Ore., have purchased the Mapleton shingle mill, which it will immediately overhaul and repair.

The Terminal Ice & Cold Storage Co., Portland, has taken over the property of the Gambrinus Brewery, and will operate it as a cold storage plant. Some new equipment will be installed, and the machinery electrified.

Government Purchases

WASHINGTON, Aug. 18.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, schedule 4341, one vertical shaper, for Brooklyn, opening Aug. 26; schedule 4364, five vertical drills for Brooklyn, opening Sept. 9; schedule 4370, one jig boring machine for Washington, opening Aug. 29.

The American Equipment Co., Detroit, has been organized to deal in machinery, tools and supplies, and has opened headquarters at 115-119 State Street. K. B. Segall, for the last six years works manager for the Michigan Stamping Co., is president, and G. F. Goodson, for five years district manager for the Bury Compressor Co., Erie, Pa., is secretary-treasurer. The company will handle the products of the Bury Compressor Co., air compressors; Black & Decker Mfg. Co., portable electric drills, valve grinders and air compressors for garages; Galland-Henning Mfg. Co., hydraulic scrap balers; Arc Welding Machine Co., arc welding equipment, and the MacLeod Co., sand blast equipment and metallurgical furnaces.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	3.37c. to 3.62c.
Burden's H. B. & S. bar iron, base price	6.10c.
Burden's best bar iron, base price	6.30c.
Swedish bars, base price	20.00c.
Soft Steel:	
¾ to 1⅞ in., round and square	3.37c. to 3.62c.
1 to 6 in. x ⅜ to 1 in.	3.37c. to 3.62c.
1 to 6 in. x ¼ to 5/16	3.47c. to 3.72c.
Rods—⅝ and 11/16	3.42c. to 3.67c.
Bands—1½ to 6 x 3/16 to No. 8	4.07c. to 4.57c.
Shapes:	
Beams and channels—3 to 15 in.	3.47c. to 3.72c.
Angles:	
3 in. x ¼ in. and larger	3.47c. to 3.72c.
3 in. x 3/16 in. and ⅛ in.	3.72c. to 3.97c.
1½ to 2½ in. x ⅛ in.	3.52c. to 3.77c.
1½ x 2¾ in. x 3/16 in. and thicker	3.47c. to 3.82c.
1 to 1¼ in. x 3/16 in.	3.52c. to 3.77c.
1 to 1¼ in. x ⅛ in.	3.57c. to 3.82c.
⅞ x ⅞ x ⅛ in.	3.62c. to 3.87c.
¾ x ⅛ in.	3.67c. to 3.92c.
⅝ x ⅛ in.	4.07c. to 4.32c.
½ x 3/32 in.	5.17c. to 5.42c.
Tees:	
1 x ⅛ in.	3.87c. to 4.12c.
1¼ in. x 1¼ x 3/16 in.	3.77c. to 4.02c.
1½ to 2½ x ¼ in.	3.57c. to 3.82c.
1½ to 2½ x 3/16 in.	3.57c. to 3.82c.
3 in. and larger	3.52c. to 3.77c.

Merchant Steel

	Per lb.
Tire, 1½ x ½ in. and larger	3.37c. to 3.62c.
Toe calk, ½ x ⅜ in. and larger	4.25c.
Open-hearth spring steel	6.00c.
Standard cast steel, base price	14.00c.
Extra cast steel	18.00 to 20.00c.
Special cast steel	23.00 to 25.00c.

Tank Plates—Steel

	Per lb.
¼ in. and heavier	3.67c. to 3.92c.

Sheets

Blue Annealed

	Per lb.
No. 8 and 3/16 in.	4.52c.
No. 10	4.57c.
No. 12	4.62c.
No. 14	4.67c.
No. 16	4.77c.

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	5.30c.	——
Nos. 22 and 24	5.35c.	6.55c.
No. 26	5.40c.	6.60c.
No. 28	5.50c.	6.75c.
No. 30	6.00c.	——

No. 28, 36 in. wide, 10c. higher.

Wood's Keystone Hammered, 18-24 gage, 9¾c.; 26-28 gage, 10¼c.

Galvanized

	Per lb.
No. 14	5.85c. to 6.10c.
No. 16	6.00c. to 6.25c.
Nos. 18 and 20	6.15c. to 6.40c.
Nos. 22 and 24	6.30c. to 6.55c.
No. 26	6.45c. to 6.70c.
No. 27	6.70c. to 6.95c.
No. 28	6.75c. to 7.00c.
No. 30	7.25c. to 7.50c.

No. 28, 36 in. wide, 20c. higher.

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per lb.
Bright basic	5.25c.
Annealed soft	5.25c.
Galvanized annealed	6.00c.
Coppered basic	6.00c.
Tinned soft bessemer	7.25c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE	
High Brass Sheet	32c.
High Brass Wire	32c.
Brass Rod	31c.
Brass Tube	46½c.

Copper Sheets

Sheet copper, hot rolled, 16 oz., 32½c. to 35c. per lb. base.

Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb. ..	$7.80	$7.55
		90 lb. ..	7.90	7.65
		100 lb. ..	8.00	7.75
IC ... $11.30	$10.05	IC ..	8.15	7.90
IX ... 13.50	12.00	IX ..	9.15	8.90
IXX ... 15.25	13.75	IXX ..	10.15	9.90
IXXX ... 17.00	15.50	IXXX ..	11.15	10.90
IXXXX ... 18.75	17.25	IXXXX ..	12.15	11.90

Terne Plates

8-lb. Coating 14x20

100 lb.	$8.50
IC	8.65
IX	9.65
Fire door stock	11.75

Tin

Straits pig	74c. to 75c.
Bar	80c. to 85c.
American pig, 99 per cent.	70c. to 72c.

Copper

Lake Ingot	26c.
Electrolytic	24c. to 25c.
Casting	24c. to 25c.

Spelter and Sheet Zinc

Western spelter	9c to 10c
Sheet zinc, No. 9 base, casks	12c.; open 13c.

Lead and Solder*

American pig lead	6½c. to 7c.
Bar lead	7½c. to 8½c.
Solder ½ and ½ guaranteed	45c.
No. 1 solder	40c.
Refined solder	34c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	90c.
Commercial grade, per lb.	50c.

Antimony

Asiatic	10c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	35c. to 37c.

Old Metals

The market is a little firmer and prices are unchanged. Dealers' buying prices are nominally as follows:

	Cents Per lb.
Copper, heavy and crucible	19.00
Copper, heavy and wire	18.00
Copper, light and bottoms	15.50
Brass, heavy	12.50
Brass, light	8.50
Heavy machine composition	18.00
No. 1 yellow rod brass turnings	10.00
No. 1 red brass or composition turnings	14.00
Lead, heavy	5.00
Lead, tea	3.75
Zinc	4.50